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CO-EDUCATION AND HYGIENE WITH SPECIAL REFERENCE TO EUROPEAN EXPERIENCE AND VIEWS

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Wherever sexes in nature are diclinous, the individuals of one sex compete with those of the other. This is a sound state of things from the point of view of selection. But with the human race it seems as if in the centres of civilization the sexes as such engage in a struggle for life. Whether that promises a healthy state of things is to be doubted.

The question of an equal higher education for both sexes is a modern one. It has different sides, *e. g.*, an ethical one and a social-political one, and I suppose that one does not go far wrong in thinking that the practical social aspect, at least in Europe, has influenced the movement very greatly.

It is not my business to deal with the various sides of the question; I intend to speak of the hygienic point of view and its practical consequences for schools.

Everybody who wishes to get to the bottom of the question must fix his attention upon the secondary sexual characteristics and qualities. I do not wish to go into the matter in all the details so often spoken of, such as the difference of absolute and relative weight of the brain, the density of the cortex of the cerebrum, the difference of specific gravity of the blood, and so on. I may pass over the consideration of these subjects with less hesitation in this country since English possesses the exhaustive book on Man and Woman by Havelock Ellis. But in any case I think I must first of all consider some psychical points.

Whatever any one may think concerning the dependence of the psychical upon the physical, experience and exact investi-

gation point in the same direction, namely, indicating that female nature is not artificially inoculated by education; it is a matter of fact well known to every one that, *e. g.*, the development of the faculty of speech is quicker in female than in male children, the selection of games offers another example, and so on.

We who are present here are naturally specially interested in the differences during school years, and first, as they touch hygiene. It is true, however, that up till now far too little work has been done in the way of exact investigation, and we still need very many stones and often better cut with which to build our building. On the other hand, the inquiries in regard to certain psychological abilities in boys and girls, like the investigations of Bolton, Netchajeff, Lobsien, and others, though valuable do not exactly belong to the subject of hygiene in co-education. The existing experimental investigations upon our question are of different values in consequence of the different methods used, the number of individuals tested, and so on, and the results of the investigations are sometimes far from having only one significance. The question is the more difficult, since the results are far more trustworthy where the girls and boys have been developed under analogous psychical conditions. It is just the co-education schools themselves that would be our greatest help. That is the reason why I shall take special notice of such results.

It will generally be admitted that the psychical variability of the male type is greater than that of the female. The experience of persons who have occupied themselves during many years with the education of both sexes points in the direction that the differences of female scholarship are not so great as in the male; we have in German the words "Wunderkind" and "Wunderknabe," that is to say prodigy child and prodigy boy, but no such word for prodigy girl. Indeed there have been a number of such male youthful prodigies in mathematics or musical composition; and a further proof of the greater variability of the male children is, that the unfavorable abnormalities are more frequent with the male than with the female. Warner has made an investigation on about 50,000 children, nearly the same number of each sex, and found in round numbers 21% (20.8) of the boys but only 16% (15.6) of the girls defective. The analogous result as to bodily condition is shown in the valuable work of Gulick and Ayres on medical inspection of schools; if one omits the evils which are to be considered as having been acquired in consequence of the minor resistance of girls, the percentage of the 4,305 boys having defects is higher than that of the 3,301 girls. Gulick himself makes a very just remark in regard to this. In Bel-

gium the punishment of boys and girls in the orphan asylums was recorded and it was found that 31% of the boys, but only 26% of the girls had required punishment.

The classical country for co-education in high schools in Europe is the grand duchy of Finland in Russia, a country of very great culture, in which co-education in high schools has existed since 1883 and where, in 1908, there were 33 such high schools with a total of 3,569 girls and 2,863 boys. In the school year 1890-91 the first contingent of co-educated high school pupils were sent to the university. Lucina Hagman, an experienced female teacher in the Laeroverk för gossar och flickor, one of the oldest co-educational high schools at Helsingfors, has published articles on the question and is anything but averse to co-education; she says quite openly that boys show more aptitude and inclination for one special subject or another, whilst girls generally try to study all subjects in an equally careful and diligent way.

It may be that the smaller psychical variability of girls in comparison to that of boys is also connected with the greater suggestibility of the girls. In the old Helsingfors co-education school they say that it seems as if the boys had an innate tendency not to accept anything as true and to think that they have the right to doubt everything. From certain experiments of Gilbert, in New Haven, with hundreds of young people of from 6 to 17 years of age one can also judge that girls are more easily influenced by suggestion than boys.

As significant may be quoted also the breaking out of certain psychical epidemics, especially in girls' schools and, in exceptional cases only, spreading also to boys' schools. Trembling epidemics (tremor hystericus) have occurred in girls' schools in Basle in Switzerland in 1901 and 1904, where the girls fell, one after another, into a condition characterized by trembling of the extremities, which lasted for minutes or even hours. The same epidemics broke out in Meissen in Germany in 1905, 1907, and 1908, in Leipsic in 1907, in Frankenhausen in the same year, and in 1890 and 1892 even in two schools in villages. In a girls' school in Biberach in Germany in 1891 one girl fell into a state of hysteric somnolence, 13 others followed, so that they could not be awakened even by pricks of a needle, but one after the other walked about the room as if in a state of trance. Once in Munich the girls in one classroom bit the ends of their plaits of hair because they believed their voices would thereby become clearer, and the girls of a Hamburg high school ate scraped chalk to obtain a fine complexion.

It is certainly remarkable that such singular youthful neuroses found in girls' schools have only there a great suggestive influence. It may be a consequence of the greater suggesti-

bility that the power of application comes more easily to girls than boys. I quote some examples. Laser, in Königsberg, made investigations upon 112 girls and 114 boys of about 11 years, using certain simple counting operations once proposed by the author because they permit good control of quality and quantity of work. He gained better results with the girls than boys. What Miss Holmes found in the psychical laboratory of Leland Stanford University led to a similar conclusion. In each of the 10 months of the school year, for three years, Schuyten made the following experiments in a series of Antwerp schools: Boys and girls of from 7 to 14 years were required to perform some task lasting in each case 5 minutes, which enabled him to discover the percentage of pupils whose attention was spontaneous. The result was that the curve of attention with the girls showed, in every one of the 10 school months, a higher level than that of the boys. Long before this, a result in the same direction was obtained by Riccardi, in Bologna, who stated the relation between the industrious girls to boys as in the ratio 3:2. When walking through the corridors of the Vienna University one may get the impression from the number of lady students one sees there that there must be a high percentage of female students, but statistics show that there are only 5½%. The fact is that ladies are more regular in coming to the lectures, whilst an appreciable number of male students prefer what they call in German "schwaenzen" (cutting lessons). With regard to the difference of psychological ability to perform work at the same age, I have mentioned that I do not know of much material from exact investigation. Certainly it is to be supposed that there will be a notable difference. As to physical statistics, those of the late Key, in Stockholm, show clearly that girls of 11 years are in weight and height below boys of the same age, but they surpass boys at the age of 16. We get similar results from the investigations of Smedley as to vital capacity and of Porter as to chest girth. Ebbinghaus has found experimentally that in certain directions of psychical work boys of 11 years are above girls of the same age, whilst the girls of 16 years surpass the boys of that age. It is clear that such facts have an important bearing on the question of co-education.

As to work done in the single subjects of instruction in high school courses, we know almost nothing definite; at least I do not know of any exact investigation upon that question. It is true, also, that difficulties sometimes arise if one wishes to make investigations in school; more than one example could be cited of persons willing to make experiments who were not allowed to do so because headmasters or school-officers feared that too much of the time for instruction would be lost in that way.

Regarding the total result of school work I know of no positive information, except that coming from the co-educational high schools of Finland. There the successes in school have been put together in various ways. The following data from the city of Helsingfors are in point. It takes 9 years for a pupil to go through the whole course of the high school, and the final examination must follow on leaving. The average marks of three series of pupils who had been through the whole 9 years' course of a co-educational school were taken out of the school certificates. The higher figure signifies a better result. The average mark was, for the boys, 7.10; for girls, 7.89.

In order to see whether the results in the co-educational schools were similar to those found in schools where boys and girls are educated separately, comparisons with averages of other Helsingfors high schools were made, and the following results were obtained:

4 unmixed boys' schools, ...	7.29
The boys' series of a co-educational school,	7.30
The girls there, ...	7.68

This investigation shows always the better result with girls. That would signify in every case praise for the girls, even if greater application only had been the cause.

When we look at all this, there is no reason to be adduced against co-education in the high school; the only question is the difference we have referred to in the ability of the two sexes at the same age. We shall speak about that difficulty when we consider the practical solution of the problem. The lower standard of pyschical variability in girls is no hindrance on the European continent, because for a great many years in European high schools no attention has been paid to the existence of special aptitude for a special subject, and in our classical or modern high schools every subject had to be learned equally by every one, and even now pupils are not allowed to omit one subject from the curriculum. A change of ideas is going on now in Germany in so far that, *e. g.*, in Prussia pupils who do not know enough at the final examination in one subject, but are very strong in another subject, are passed so that they may go on to the university and get degrees.

We see that according to European views there is no serious objection to be found against co-education in high schools. Now let us look at the physical side.

The completion of growth in boys requires a longer time than in girls. The difference between the physical condition of boys and girls shows itself very distinctly in their ailments, probably also in their mortality; as to the latter I quote only the statements of Hartwell of Boston: while the lowest mortality among boys is during the 13th, 14th, and 15th years,

among girls it is during the 12th and 13th years. With regard to morbidity we have data based upon very numerous observations coming from Denmark, Sweden and Norway. Investigations have been made, especially in Sweden, as to health, time of work, sleep, and so on. At that time no co-educational high school existed, but boys' public high schools and girls' private high schools. From the latter, certificates naturally had not the same value as those from the boys' schools, because in those days the girls who studied did not do so to get certificates to enable them to obtain positions like the boys. Mark well that in Europe certificates are a thing of the greatest importance in earning one's living, since without them public positions are impossible and others not at all easy to obtain. Now, the percentage of illness is as follows:

	Boys investigated	% sickly	Girls investigated	% sickly
Denmark,	16,789	29.	11,336	41.
Sweden,	11,210	34.4	3,072	61.7
Norway,	830	21.9	500	36.7

The material is not quite the same. In the Denmark statistics are included boys of boarding schools and public high schools and girls of private high schools, in Sweden and Norway public high schools for boys and private high schools for girls. Further, the investigations in the different countries have not been made at the same season of the year; but in all these statistics no case of acute illness is taken into account, but only impairment of health of different kinds and various chronic troubles.

A small comparative investigation has also been made in Halle, Germany, of boys and girls from 7 to 14 years old only; there also the percentage of sickly girls is higher than that of boys, and reaches 50 %.

Sustained severe work for children under the conditions of school life leads very easily to repeated nose bleeding and to headache, which are, alas, not uncommon during school years. The special causes are different, *e. g.*, that the flow of blood to the brain under those special circumstances is increased, the return flow is rendered more difficult from various reasons. In a girl high school at Hamburg 50% of the girls suffered from habitual headache, 16% from repeated nose bleeding; investigations concerning the home life gave the result that only in one-tenth of the cases influences such as exciting drinks or hereditary tendencies were to be regarded as simultaneous causes. Statistics naturally speak with greater authority if both sexes can be compared.

In Sweden the following results have been obtained:

Number investigated	Habitual headache %	Chlorosis %
11,210 boys	13.5	12.7
3,219 girls	36.5	35.5

When one compares these results with the average daily time for obligatory work one finds that the latter has been lower in girls' high schools in every year than in the boys' schools for the same age. As I mentioned before the Swedish statistics compare boys' public high schools on one hand, and girls' private high schools for the upper classes on the other, for which the work registered is not the same. For results in co-educational high schools we must go again to Finland. The reports of one of the high schools, the Nya Svenska samskola give data as to the causes of non-attendance for the years 1896-1898. The causes for school days missed are as follows:

	Habitual headache %		General weakness %	
	Boys	Girls	Boys	Girls
1897	14.2	31.2	0.6	2.6
1897	13.3	20.6	0.8	6.3
1898	10.1	24.1	1.6	6.1

Thus the girls show much less regular attendance, owing to repeated headache and general weakness, than the boys.

In the small Danish city Naestved there exists a co-educational school, where the non-attendance days of boys and girls were compared. Out of the 250 school days of the year each boy missed on an average 5.8, each girl 10-2 school days.

Gymnastics, by which we mean drill, is obligatory for both sexes in Finland co-educational schools; exemption can only be obtained by a certificate from a physician.

Now Palmberg found in 1890 in the Helsingfors co-education schools that the percentage of those exempt from gymnastics was as follows:

Out of 1,275 boys 3.06% were exempt, of those 49% were exempt on account of weakness.

Out of 973 girls 11.63% were exempt, of those 65% were exempt on account of weakness.

Similar results have been noted by Lindholm, who in 1900, made his investigation not in Helsingfors but in eight small cities in Finland; in the total number of those towns the percentage was as follows:

Out of 1,921 boys 8.7% exempt, of those 25% were exempt on account of anæmia and general weakness.

Out of 1,427 girls 14.0% exempt, of those 60% were exempt on account of anæmia and general weakness.

There also a higher percentage of girls were exempt, among the causes conditions of weakness being more prevalent. Also the mortality from tuberculosis is higher in Finland among girls than among boys.

Let us now compare the differences at different ages. I can use the Swedish statistics for that purpose, and I select from the Swedish boys' high schools the classical schools only, because they show the greatest morbidity, and thus the difference from the girls' private high schools becomes as slight as possible.

Age, .	11	12	13	14	15	16	17	18	19
% ill, boys, classical school,	34.4	37.6	38.0	37.4	36.6	34.7	38.6	40.5	36.9
% ill, girls, high school,	55.7	59.7	64.8	64.4	63.1	63.9	62.5	(68.6	60.3)

Though I chose from among the boys' schools the classical school with its high percentage of illness, the difference between the boys and girls is striking. In every year the percentage of sickly girls is much higher than that of boys. In both sexes the percentage of sickly pupils increases up to 13. The great relative difference is characterized by the peculiarity that with the boys, at the moment when the vigorous increase of growth arises, which signifies the beginning of puberty, the percentage of sickly boys decreases; whereas with the girls, with whom that development begins at an earlier age, the high rate of morbidity continues for a remarkably long time during that period. In Sweden the mortality of girls from 12 to 16 years old was also found to be higher than that of boys of that age. A further proof as to age and bodily resistance is the following from co-educational schools. In 1890-91 Pipping weighed the boys and girls from 8 to 20 years of age in four Helsingfors high schools in the different terms of the scholastic year. The results obtained in two co-educational high schools with a total of 507 boys and 636 girls show, as far as development can be determined by increase of weight, that the increase during the course of the year is similar for boys and girls up to 11-12 years. Later, during the years of 13-14, with the development of puberty, this increase during the school year becomes remarkably different in the two sexes; with every additional year, it becomes more apparent that the increase in weight amongst the girls takes place principally during the holidays, especially the long summer holidays. From the 16th year upward there would seem to be no increase of weight among them at all during the term, but even diminution was noticed; other results have been obtained with the boys, who showed a more equal increase during the school terms themselves. Those observations show clearly that in such climates with the development of puberty the organism

of girls gives evidence of a physical weakness and a greater sensitiveness to hard work.

I shall not weary you with any more dry statistics. From whatever point of view one looks at the matter so far as reliable material exists, a critical study of European statistics based on physical aspects, shows unfavorable conditions for the girls, with regard to the power of resistance to noxious influences.

It would seem especially that the augmentation of the percentage of girls with characteristic kinds of ill health during the age of the development of puberty merits attention in every way. It is also a well known fact that the time of that change is not only accompanied by physical troubles but also often by a psychical depression and retarded interest and fitness for mental work; and these facts must strike us all the more because well developed, healthy girls, under favorable circumstances, pass through that process of development, which is a *physiological* one, without difficulty, whereas the above named troubles will arise under unfavorable conditions with girls who are not completely healthy, and yet whose percentage is a high one as statistics have shown for the age previous to puberty. The facts referred to are facts with which schools as institutions for the masses must reckon, and the causal connection of the above mentioned troubles with the injurious influences of school life such as continual sitting in bad conditions as to air and light, together with difficult and trying home work is obvious.

With the girls the development of puberty encroaches seriously upon the general development in a different manner from that which it does with the boys; the normal progress of that development is of importance for the whole future life. The first marked sign of the sexual life is only the terminal link of a long chain of natural processes, but from that moment a new great difference of the sexes shows itself by the regular oscillation in the physical and psychical life of the woman.

There cannot be any doubt that the development of puberty in girls represents a process in which hygienic matters have a still higher importance than with boys; therefore in the school régime also, the observance of the rules of school hygiene for the girls should play an important part. It is true, however, that we cannot, up to the present time, find that the schools have taken such special notice of the progress of development of the boys.

Culture has in the last half century conduced, at any rate in the central parts of the European continent, to make the burden for youth in the higher public education continually heavier; however, it is true that a perception that something

may be wrong is gradually gaining ground here and there, but even in the new kind of schools erected for girls it is not apparent that sufficient attention is paid to hygiene.

When we refer to all the material at our disposal we see that with regard to the mental gifts and abilities of girls there are hardly any serious reasons against co-education in high schools, but that their physical state and development speaks decidedly against loading them with such a burden as the boys have to bear now in our European high schools.

Certainly we know that there have been already several women with exceptionally high scientific gifts, and that a remarkable number of girls have gained the knowledge demanded by the high school curriculum under the greatest outward difficulties: but that is no proof that for a number of girls analogous in percentage to the number of boys taking the high school curriculum such studies would be advisable. Let us look at the school history of co-education in Finland. The total number of female university students in Helsingfors was 19 up to the year 1890; in the year 1890-91, that is to say, when the co-educational high schools first held examinations for those leaving, the number mounted up to 150. Now there are 2,500 students in Helsingfors University, out of them 500 lady students, that is to say 20%. What were the female university students going to be? From the official reports of the president a great difference is to be seen between the female students before 1890 and the later ones; the few out of those early days, who were obliged to make headway, were distinguished by a high degree of intelligence and energy; not less than 13 out of the 19, that is to say 68%, finished a complete university course of study with examination; out of the ladies there are at present only 12% who take any examination. Similar results were noted also with regard to the numbers of female students at the Geneva and Zürich universities in Switzerland. There also the results of the final examination went down with the increase of the number of pupils. In Helsingfors before 1890 100% got Laudatur, the best mark; 1890-91 55% got Laudatur, 7% Approbatur; 1899-00 15% got Laudatur, 41% Approbatur.

Another question in connection with co-education is the morality question; it only touches hygiene, but it is a critical one. In northern Europe, especially in Finland, where, as we have seen, the system has already been in practice for some years, it was naturally remarked that other than comradelike inclinations sometimes arose, but nothing objectionable or improper was noticed. It has been observed in Denmark that the boys in co-educational high schools prefer to choose the lady of their heart from a girls' school rather than from a co-educational one. I do not intend to speak here about

adolescent love, but refer you on this point to the chapter so excellently treated in President Hall's admirable book on Adolescence. I shall only remark that in these northern countries sensuality probably may not be so much developed as in southern ones. During the last years in different smaller cities of Germany and Austria co-education has also been established in the high schools, and we may hope to get by this means knowledge of the results of this system in other European climates also in the course of time. I think that in every case European continental high schools are in many respects differently constituted from American ones.

As everybody knows some other possible psychical influence, which has to do with special secondary sexual characteristics, may be expected to work favorably in its effects with co-education; the girls may learn from the boys to criticise their subjects of study and become influenced by the specialistic tendencies of the boys, they may learn to be more independent and capable of deciding for themselves and get rid of superfluous shyness; on the other hand, the greater refinement of the girls may have a propitious influence on the boys in causing them to cultivate more moderation and gentleness. It may be that co-education will also have a good influence on the views of parents; up till now, girls have not been given enough freedom of mind and body in Europe in consequence of traditional customs.

In every case we must always come back to the fact that the power of resistance is weaker in girls, and their course of development different from boys; there cannot be any doubt that therein lies an important argument against co-education based on the present curriculum in our European boys' high schools. There should be a tendency to give such a character to the curriculum that release from hard work could be obtained at certain times without necessitating a dropping behind in the studies. That is a question difficult of solution.

Notwithstanding all these difficulties, I suppose we shall also have before long a co-educational system in the high schools in central Europe to a certain extent. It is a characteristic feature of higher female education in Europe that first of all private schools for girls have been founded, that money was obtained for such schools from private people, and these schools were expensive ones and accessible only to the upper classes of society. They had a certain freedom as to their curriculum. The certificates naturally had no public, no official value for gaining positions or leading to university studies. Afterwards official curriculums arose, and certificates of the schools thus gained a certain official value; the old private schools now began to adapt their curriculums also to the offi-

cial ones, and new schools arose, again founded by parents, that is to say, undertakings with no financial gain as an object. In the different states of the European continent nothing or relatively small sums only have been contributed from the public funds up till now towards the expenditure on such girls' high schools, though the state reserves to itself the right of approving the curriculum and superintending the education; in return the state gives certain rights such as admission to the universities. Therefore school fees must naturally continue to be high ones. There are exceptions, as in democratic Switzerland, where girls' high schools also are accessible without fees.

Out of the girls attending high schools in Central Europe only a certain number may wish to reach a higher level of mental development for its own sake; the greater proportion of them will probably have to earn their living with what they have learned. The tendency towards the higher education of girls will probably increase more and more for both reasons, and so a good practical solution of the co-education question is not the least important part of the girls' high school question on the European continent.

Now in large cities separate high schools can be run by private enterprise, but if the girls are allowed to attend boys' high schools (which are, with very rare exceptions, day schools and founded by public funds), these girls should pay only relatively low fees, and if they come from poor families, then no fees at all, just as it is in the case of the boys. Further, in small cities a public high school for boys often exists with only a small number of pupils, so that there would thus be plenty of room for the girls wanting higher education, but it is practically impossible to erect a high school in such small places for the limited number of girls in question. It is also a matter of fact that in such small cities, where almost every one knows each other personally, and meets here and there, and in this way a sort of involuntary public control of youth exists, there cannot be so much moral danger from co-education in a high school.

I remarked that with us it is a question of day schools only. As to practical arrangements, it would be first of all sufficient to have separate cloak-rooms and so on for the girls. Further, separate drill, as girls are not so strong in muscle as boys and have less lung capacity; probably, too, they themselves would not care to play football.

The real difficulty lies in the curriculum. I must remark that in our classical high school, which is called "Gymnasium," as also in the modern side of the school, which is called "Realschule," and in other high schools, we have no optional system,

and I don't suppose we shall attain anything of that kind in our high schools at present; only certain subjects are optional outside the course of the already severe normal curriculum as, *e. g.*, singing or stenography, or in classical schools one modern language, or in the modern schools modelling, and so on. I would remark that all these schools begin their work with children of ten or eleven years of age.

The true policy would be that every one should have the opportunity of learning as much as he or she is able to do, without injury to health. As far as we are allowed to judge from all that we know about health and development, it would be against hygienic principles to oblige girls to learn in co-educational high schools everything that boys are obliged to learn in these days. But one could arrange things so that just in those subjects to which the greatest number of hours are devoted each week in school, and for which, therefore, most preparation is required in the home work, the curriculum should be made lighter for girls and adapted in respect to quality and quantity of work, so that the resistance of the sex and its variations in the different stages of development be taken into consideration. Thus, *e. g.*, it would be sufficient in our classical high schools to diminish the Latin and Greek in the curriculum for girls. By this means girls would get rid of a number of school hours and home studies, and could use this extra free time for walks, open air games, skating, and so on. After they had passed through the whole school with the boys they could take the final examination with them also, but at a lower scale for certain subjects. A number of girls would be content with these studies either with or without the reduced final examination; for it may be that they are seeking a higher education only for its own sake, or they are not sufficiently gifted for such an examination, or they do not want to go to a university to get a degree. It is indispensable for those who wish to get a university degree to have passed a complete examination on leaving a high school. Now it could be arranged for those girls who have finished the co-educational high school and wish to get degrees, to study a year or a year and a half longer at a high school, where they would learn what is needful for passing the final examination, at a riper age and with more resistance also because they have preserved a better state of health. In the European continent there would be no injustice in that system because the boys lose more than one year by being obliged to spend that amount of time in military service, or if they are physically unfit, to pay a tax for several years for exemption from military service.

It is possible that such a solution may seem strange from an American point of view; but in old Europe for every public

position, even for a very inferior one, and for the greater number of private positions, certificates are the first requisite and are invariably asked for.

Everybody knows that in the United States co-education in higher schools not only is very general already, especially in certain parts of the Union, but is making further progress, as one sees from the reports of the Commissioner of Education.

In pedagogical matters the scientific experimental method should be much more used and the results studied, especially in Europe where all education is regulated generally in a very decided way by public administration. Trials have been made already with co-education in Baden and Wurttemberg. In the Grandduchy of Baden the Ministry declared that, as the schools have been founded as boys' schools, the number of girls admitted should be limited with no regard to the special features of the education of the female sex. The ministry states that the experience with the girls is a good one. In Wurttemberg, where the boys' high schools are mostly the property of its cities, a number of them have already allowed girls to enter; every city which intends to make the boys' schools acceptable to girls also is obliged to make a special request to the Ministry for such permission. Also in Saxony since Easter 1908 co-education in the present high schools for boys has been started in a cautious way; but in every single case parents must make a special application to the minister of public education.

The resources of nature are quite inexhaustible in all that is wanted for the healthy existence of mankind. We cannot expect that care for the welfare of every individual should arise from love for one's neighbor; but hygiene shows that unhealthy conditions in one class of people may have dangerous consequences also for others, even if these live in the most favorable circumstances. So from reasons of self-interest alone progress may be made for the good of all. Practically man as lawgiver has not taken enough care of women. In a low state of culture he often treats her as a slave, whether she is forced to perform the hardest work or to live the confined life which is the lot of Mohammedan women, and even in highly cultured European states one hears a great deal spoken about the lower resistability of woman; but it is admitted at the same time that she does the hardest muscular work day and night in earning her living, and that women in public positions are paid at a lower rate than men and not allowed to attain the same positions, though they do the same work. I feel sure that in the centre of Europe the cry for the higher public education for girls and consequently for co-education, arose first of all because families who lived in good or tolerable circumstances,

through the wages of the father, looked in despair on the future of the daughters. Ensure to all poor girls the means of earning their own living and the tendency towards higher education will have another character.

We cannot, however, deal with Bellamy in practice. There is no doubt that co-education in high schools is a difficult question in various ways; from the hygienic point of view, because resistability as a whole and the variations especially are different in boys and girls, and the states of morbidity acquired by girls at the adolescent age so often continue in the future life of the woman and consequently may influence future generations also.

Co-education should be considered everywhere as an important public matter, and the higher education of the female sex should have regard not only to advantageous knowledge but also to physical soundness and improvement.

THE MAIN PROBLEMS OF SCHOOLROOM SANITATION AND SCHOOL WORK

By Prof. Leo. Burgerstein, Dr. phil., Vienna, Austria

The schoolroom deserves special consideration, because the pupil is obliged to be in it during the greater part of his daily work in school, and to do his lessons there under conditions likely to become objectionable from a hygienic point of view.

Light, air and correct positions are the main points to be considered, and for the reasons just mentioned the schoolroom merits the first attention when planning the house.

As to the dimension of the room, the cubic air space is the more favorable the greater the room in relation to the number of pupils. How many pupils are to be instructed together in one room is, alas, a financial question. Practically, one could put a greater number in one room if the latter were relatively big enough, but it must be borne in mind that there is a difference between universities, *e. g.*, and schools in a stricter sense of the word.

With respect to pedagogy, each pupil's share in the teacher —if one may say so—becomes less, the greater the number of pupils in the schoolroom, so that the enormous advantage of being taught with others instead of being taught alone has also a limit in a pedagogical sense. Further the pupil's range of ear and eye is limited, and the question is important with regard to the hygiene of the teacher, whose nerve-destroying work increases with the number of pupils and the strain upon whose voice varies according to the dimensions of the room. Nervousness and diseases of pharynx and larynx contribute in a prominent degree to the statistics of the ill-health of teachers.

Taking all these points into consideration, it would be better for the schoolroom to be not more than about 30 feet in length. The breadth of the schoolroom should be determined from a pedagogical-hygienic point of view; because rooms too great in breadth render it more difficult to see all the scholars at the same time; and of special importance is the breadth with regard to light.

The aspect of the schoolroom windows is an important matter, a southern exposure commanding much better light than a northern one, and a temporary bathing of the schoolroom in sunshine being of value for the health in different ways, *e. g.*,

in consequence of the bacteriacidal influence of sunlight. As far as circumstances allow choice of aspect, it will be also of importance when making the decision to consider whether the climate is warm or cold, whether pupils are robust and well nourished or frequently feeble and anæmic, and so on.

Much time has been bestowed on experiments with persons of normal eyesight, who read printed matter quickly, to find out the minimum amount of light needful for a school-desk. We now have photometers, by which we are enabled to measure the intensity of the light which is reflected from the desk itself, while formerly one could only measure the intensity of the light of a self-lighting object. Further, let us imagine that the greatest circle of a globe is divided into 360° and over every such degree a square constructed, then we have what is called "square-degree" (Qg.). The whole celestial globe has more than 41,000 Qg. Now instruments have been invented by which it is possible to measure how many Qg. send light to the pupil's desk in question; since the angle of the ray is also of importance, one must reduce the Qg. to a horizontal plane and get by this means the reduced area-angle, the "Raumwinkel." R. W. Pleier, of Karlsbad, Austria, has constructed a practical instrument by which one can measure the area-angle without being obliged to reduce it. A photograph is made simultaneously with the reduced square degrees.

Now it is possible to find out in a scientific way, by means of such instruments the exact amount of light which falls on a school desk; but if there is not light enough then the scientific statement of the fact will in almost every case be of no practical consequence, because it is too difficult and too expensive to make alterations in a house already built. Therefore it is of importance that the right amount of daylight should be guaranteed when the house is first being planned; for that purpose more or less complicated calculations have been proposed, so that 25 meter-candles (10 in red light) or the 50 reduced square degrees or area-angles may be secured. Such calculations, however, will only be made in exceptionally rare cases, and therefore I should rather prefer to have resource to a simple method which can be used by every private architect, even in the country. Let us imagine a vertical section of the future schoolhouse so made that the section is perpendicular to the front of the schoolroom and the street, and the sketch of the house which is or can be erected opposite to the schoolhouse. Now we mark in the schoolroom the top of the desk which is furthest away from the window; we draw from that place one stroke which touches the upper edge of the schoolroom window which is opposite to the desk, and a

second stroke which touches the top of the roof of the building opposite to the schoolhouse. By that means we can see immediately whether any light at all from the sky falls directly on to the desk in the worst position on the floor in question; if direct light reaches that desk, the room will do. Insufficiently lighted rooms will be found chiefly in the lowest stories; to avoid this schoolhouses must be built at a greater distance from the opposite house, or the lowest floor must be used for other school purposes than schoolrooms, or it could be let. If possible, it is better for the schoolroom not to face the street, but a big courtyard or a garden, where there is less noise and dust, so that windows in summer time can remain open during school hours. The proposed plan is not strictly scientific, but it must be observed that up till now the results obtained from scientific investigation as to the necessary amount of light have not always been found to be incontestable.

In every case the strongest light must come from the left side, otherwise shadows from parts of the body fall on to the paper when the pupils are writing. Intensity of light decreases rapidly with the distance of the desk from the window, and we also see that the intensity of light depends on the height of the upper line of the window, and therefore also on the height of the room itself, which it would be better not to make less than 13 feet (4 m.), if the room is 19 feet (6 m.) broad.

From this it also follows that windows should reach up to the ceiling and that their upper part should not be shaded by curtains when they are not necessary. Architects do not always comply with the request that windows in schoolrooms should be separated only by very small mullions and the top of the window should be horizontal; they sometimes prefer Gothic windows, and the like, but they make a great mistake. We like a table nicely decorated for dinner, but the main thing is to have good and sufficient meat and drink—"panem et circenses," not *vice versa*. The right problem of art in those things made for practical use can only be how to embellish them after the needs are satisfied. And experience shows that an architect can quite well make a schoolhouse look nice, even though he respects the requirements of hygiene.

It is a pity that in schools, artificial lighting also must often be used. Though progress in artificial light has been enormous during the last 25 years, in many schools over-heating and the production of noxious gases are still only too common, and another and very fertile cause of injury is to be found in the shadows caused by artificial light. A schoolroom may be excellently lighted so long as there are no pupils in it, but when pupils sit down, a number of them may have to work in

deep shadows from head or body. One may then find by measuring that perhaps only six per cent. of the light which should fall on the desk is actually at the disposal of the pupil who is sitting there. To avoid this evil, Jaspar, of Paris, in 1881, invented a device for artificial diffused light, without shadows, the light being directed first of all by shades to the white ceiling and white upper parts of the walls, and being given back from innumerable points of reflection as a diffused light. The light may be quite excellent when the lamps are first installed, that is to say, sufficiently strong, but in cities with much dust and soot the ceiling and the upper side of the shades become dirty very quickly and get covered with dust. As some trouble is involved in climbing up to see whether there is dust on the shades, servants do not bother themselves about it, and the headmaster will certainly not mount a ladder to see if the servants have done their duty. It is now preferable with electric light to fix the lights directly on the ceiling, so that the light is as far away as possible, and therefore the shadows are less deep.

When the lighting is unfavorable bad positions are inevitable, and thus respiration, circulation, digestion, and eyesight become impaired.

As there cannot be too much diffused light in a schoolroom so we cannot change the air too much, but annoyance from draughts must be avoided. If we compare the amount of air space in private rooms for one person with the amount in a schoolroom, we see immediately how unfavorable the conditions are in the latter, even when not crowded. To improve the air one could make the cubic space per pupil greater by increasing the height of the room; the increased height would not make speaking and hearing more difficult, but such rooms are not so easy to heat. It has been generally supposed that the products of the respiration and perspiration contain poisons also, and much effort has been made to discover exactly what those poisons are; but it has not been possible to ascertain their chemical quality, therefore much less their quantity. But it would be probably not quite right to conclude from this fact that such substances cannot exist, and do not work injury. We have known, *e. g.*, that the springs of Gastein in Europe have a wonderful sanitary power, but chemistry could find no special substances to explain the fact; since radio-activity has been discovered it has also been found that the Gastein water is radio-active—it may be that therein lies the reason of its sanitary power.

The father of hygiene in Europe, Pettenkoffer, supposed that those indefinable noxious substances, produced by respiration and perspiration, increase in proportion to the carbonic acid

produced by men, and therefore the quantity of carbonic acid in the air would be a means of measuring the quality of the air. So much is sure, that the carbonic acid produced solely by the presence of people in a room is a means of judging the quality of the air, because the air exhaled contains a hundred times more carbonic acid than the natural air inhaled, and, with the increase of carbonic acid in the air breathed into our lungs, that air approaches more and more to the quality of the air exhaled, so that diffusion in the lungs must become less and less. But Pettenkoffer considered one pro mille of carbonic acid as the maximum which should be allowed in the air of a schoolroom, and he came to that conclusion because he found that then the air smelt foul in consequence of the unknown substances produced by human beings at the same time as the carbonic acid. Now that conclusion is false, because the smell of air depends not only on respiration and perspiration but in a great degree on the cleanliness of the bodies and linen of the people themselves. There seems to be some degree of mystery in the air question. But very interesting is the fact that Weichardt has found the poisonous "Kenotoxin" in the exhaled air, also.

Every care should be taken to keep the air of the schoolroom as free from dust as possible; in the first place not to introduce dust and secondly not to produce it in the schoolroom.

There cannot be any question that we must do our best to ventilate the schoolroom, even if we cannot prove sufficiently in a scientific manner the existence of self-poisons in the air.

In every case it is necessary that the windows of a schoolroom should be made to open wide and without any difficulty, so that the pupils themselves can open them. I do not as yet know of an ideal schoolroom window for cold climates. If the breaks between lessons are not too short, let us say at least of 12 minutes' duration, one can use the windows for abundant and quick ventilation even in winter time in temperate climates. The caloric capacity of air is very low, but the walls and the furniture contain much warmth and lose only a trifle of it if, *e. g.*, on a cold winter day, all the windows are opened for a minute or two, and the greater the difference is between the temperature of the schoolroom and the air outside, so much the more quickly is the air in the room changed and renewed; and the remaining time of the recess will be sufficient to make the fresh air warm, which has come into the room.

The use of windows for changing the air is of a certain educational value in the country; we have a facetious proverb in Europe to the effect that the air in the country is good because the peasant never opens the windows of his dwelling.

The usual method of ventilation is what is called in English the "natural system;" the air from outside is conveyed through a channel to a space between the stove and its mantle, and an opening in the wall of the schoolroom allows the foul air to enter a flue which conveys it out of the house. The difference of weight and therefore pressure of the warm air inside and the cold air outside makes air move like liquids of different weight in communicating tubes. The system is of value; but it is not sufficient because its working depends on the difference of the temperature of the air inside and outside, and so for the schoolroom the ventilating value of the system depends on the greater or less heating of the room, and the effect decreasing with diminished heating, though the necessity of ventilation is always the same. It would be a help to heat the foul-air flue when the schoolroom itself is not warmed. Still less reliable is the apparatus for ventilation by which the pressure of wind can be utilized; since this pressure is a continually fluctuating one. The best method is the plenum system, but it cannot be introduced in every country schoolhouse.

Much progress has been made in recent years in methods of heating; a very easy regulation of temperature can now be obtained in many schoolrooms by central heating. But we must not forget that man is a warmth-producing body and he must lose the surplus by radiation, vaporization and conduction of heat; now in the schoolroom, in the neighborhood of one such warm body are other warm bodies, which must also lose their heat. Therefore, schoolroom air must not be too warm or too moist as we shall see from the following experiments. In Flügge's laboratory experiments have been made with a man enclosed in a small glass room under differing conditions of warmth and moisture and percentage of carbonic acid in the air. Similar experiments have also been made with pupils in a schoolroom. If the carbonic acid increased up to 10 to 16 pro mille, but the temperature was below, sometimes far below 68° F, and the relative moisture was not higher than about 47-72 per cent., the person felt quite well, although the chemical composition of the air was in an appalling condition and the experiment lasted from three to four hours, but if the temperature was raised to between 68 and 86° F., and the relative humidity was 47-92%, then symptoms of illness such as giddiness and so on arose, even after 10 to 13 minutes, though the carbonic acid did not reach more than 13 pro mille. There cannot be any doubt that the retention of warmth in the bodies of pupils in the schoolroom must be avoided, but I do not think we ought to conclude from these experiments that pure air in schoolrooms is superfluous.

For a long time the greatest problem of school hygiene has been the school desk, and it is so still. It may be somewhat audacious to speak in the United States about this matter, since Barnard in his article on school-architecture in the Connecticut Common School Journal, as far back as 1838, was the first to speak sanely on the question. Since that time American and European authors have occupied themselves with the problem as, *e. g.*, Hartwell, Porter, and Scudder in the United States. The first essential of a good school desk is that it should permit of healthy positions. While certainly one can sit in malposition at a good desk, in an objectionable one pupils are forced to sit badly. It is necessary that the desk should have the right dimensions, and that it should give some freedom of movement also. Otherwise the most important bodily functions, such as respiration, circulation and digestion, are obstructed, and pathological curvatures of the spine are produced. Purely pedagogical and economical questions also are of importance. Single desks, such as are in use in the United States, and also in England and Sweden, are preferable, because they diminish dangers of infection and pedagogical difficulties.

I had already occupied myself with school hygiene for some time before I thought that the desk I used myself for many hours a day, might not be the best from the hygienic standpoint. In fact, the seat was too high and my feet did not quite reach the floor; therefore I cut the legs shorter. Now the desk itself was too high and I cut its legs shorter so that, when my arm was hanging vertically, the elbow was just the same height as the desk. Now, as I could not get my own legs beneath the desk, I took out the middle drawer and cut off a piece of the drawer, and now I was able to get my seat so far under the desk when writing that the distance from the edge of the desk to the back of the seat could be made almost as great as the sagittal diameter of my breast. Now my work was quite a different matter, much more healthy and agreeable, too. There may be ladies and gentlemen in the audience who do not sit hygienically at their own desks, though they are interested in the hygiene of their pupils. "Charity begins at home," and therefore it is well to begin reform on ourselves first.

We can place our seat further back when reading, *e. g.*, and the pupils need not always sit as near the desk as is correct for writing. Therefore school desks should be made with movable parts, and they must also be adapted as far as possible to the individual height of each pupil.

The conditions I have sketched in a cursory way are those necessary for every school; but the movable desks can

be omitted in country schools; for it is important for village schools to get desks cheap, and the total number of daily school lessons and of school years is lower than in high schools, also country children are more occupied in the open air and do more bodily work in general, so that their muscles are more strongly developed.

There are two means of getting desks suitable from the hygienic standpoint. One can choose desks of different sizes or make the desks adjustable to the varying size of the pupils.

It is a pitiful fact that in many cases no trouble is taken over this matter except that the carpenter receives the order to make the desks, and nobody cares whether the sizes he furnishes are suitable for the pupils. A good model may be chosen, but no one bothers his head about the details which are equally important. I have made an investigation concerning the desks in every Austrian high school, numbering about 300 with nearly 100,000 seats, and the results have been pitiful; for it is a sad fact that in five-sixths of all the high schools the whole work of hygienists and technical experts has been done in vain. I feel sure that in many European states the result would be no better in this respect.

As the unadjustable desks are made so that every special size is planned for a stature within certain limits, I proposed many years ago that the manufacturer should make a lathe, marked not by inches and centimeters, but only by stripes signifying the height-limits for pupils, who should be seated in the corresponding sizes of desks. In this way can be found out in a few minutes how many desks of each size are required for a given schoolroom. As the size of scholars in a classroom varies every year and the pupils grow taller during the year, it would be a good plan to measure the pupils half-yearly during several years before supplying the new desks and to buy also an extra number of desks for exchange and put those not wanted at present in a storeroom in the schoolhouse. Further, as the size of pupils sometimes varies considerably within small geographical distances according to race and standard of life, it is better to make such measurements in every case, before a school is to be furnished with desks. In villages where conditions are of the simplest and great outlay is impossible, nothing can be done, except to buy what is necessary for the average requirements of the pupils after the measurements referred to above have been taken. Place the desks so that the lowest are next to the teacher's platform, and the higher desks in graduated rows behind; to seat the pupils, first arrange them standing according to their respective height and then place them in the

graduated rows of seats. To be sure, that is not the best way of seating, but the best way under such circumstances.

It is difficult for a country carpenter to make suitable desks in different sizes. A teacher, Walter, of Dornbirn, Vorarlberg in Austria, has found a practical solution of the difficulty. He sells a drawing in which all the different sizes of a simple double-seated desk are shown according to scale, in such a manner that every simple country carpenter can make the desks correctly with the help of this drawing. The drawing costs about two dollars (10 crowns Austrian value).

All desks not adjustable have the disadvantage also that they must leave out of consideration relative individual differences; there are pupils thick and thin in body, those with relatively long and short legs, and so on. In every case adjustable desks are the best, if one can make sure that the adjustments are made, but they are naturally expensive. It is more economical to have only a certain percentage of adjustable desks in the schoolroom, as, *e. g.*, has been ordered in Brooklyn, where 33 1-3% of adjustable desks are ordered for a schoolroom. So far as I know only the United States and Great Britain up to the present time, are so far advanced that adjustable desks are in use in a considerable number of schools.

It is also of hygienic value that desks should not make it a difficult matter for the floor to be thoroughly cleaned. The different arrangements possible for that purpose are first that the desks should only touch the floor at certain points, a means used with simple desks in France first of all I think, or, secondly, that they should be reversible, this kind being first used in Lausanne in 1887, or, thirdly, that they could be moved on castors, so that whole rows of double desks can be easily removed in this way; this kind was first introduced in Europe by Zollinger in Zürich, in 1900, and is the most practical plan for such desks in my opinion.

The most objectionable occupation at the school-desk is writing. Unfortunately, when we write at the desk we must always bend the head somewhat. It is also necessary to observe certain positions of the body, hands, and so on.

I shall not here enter into details, but so far as my experience goes, I consider that the training of children in such matters, when they begin to learn to write in school, is generally too much neglected, because it would naturally cost time and trouble, and because it is a complicated matter for children to learn to write in a correct way; but the labor is well worth the trouble it involves.

Writing should at first be constantly interrupted at short intervals, whenever it is seen that the children are fatigued.

Much has been written about the question as to whether upright or slanting writing is preferable in school. The question is very difficult to solve in a scientific way, because different attitudes and movements of the eyes, the head, the fingers, the hand, the upper part of the body, and the pelvis must be taken into consideration; and because it is a question not only of the strokes with the pen but also of the continuation of the lines of writing, and because the manner of holding the pen, the quality of the desk, the varying bodily strength, and the previous training in writing complicate investigation.

We will imagine that the exercise-book is lying on the desk straight in front of the body, so that the lines in it are parallel to the edge of the desk; if I now make a down stroke I move the pen towards the bisecting line of my body; the down stroke is perpendicular to the line in the exercise book. That is the so-called upright writing.

Now suppose I lay the exercise book again in front of my body, but this time aslant so that the lines slant upwards from left to right. If I now make a down stroke I again move my pen towards the bisecting line of my body; the stroke is slanting to the line. Now I have the slanting writing.

In both cases the exercise book is in front of the centre of the body, and we see that as to the formation of such a down stroke, eyes and hand have to perform just the same work whether the writing is upright or slanting. Then, if a different influence on the bearing of the body by the two methods of writing exists, it can only be sought the direction of the lines in the copy-book, that is to say in the continuation of writing.

It is to be seen from Schubert's observations and those of others that with slanting writing the head is much oftener turned to the left or inclined to the left than with upright writing. Now we will imagine that head and body may be held quite correctly, only the head is inclined somewhat downwards and the centres of the eyeballs may be joined by a line which we will call the base line. If I now put the exercise book before the centre of my body, as I did for upright writing, and I look at a certain point of a line in the copy-book then a plane is given by three points, the two ends of the base line and the point I am staring at; that is the "plane of direction." If we now imagine that the base line glides down in the plane of direction we see that line fall in the direction of the writing line. Now we place our exercise book in front of us, as for slanting writing, and look at a certain point of a line, *again* without turning the head or body or inclining them to one side.

Let us again imagine that the base line glides down in the

plane of direction. We see now that the projection of the base line in the plane of direction crosses the writing line.

Now I will incline the head to the left, so that the right end of the base line is higher than the left. In that way I can give to the base line such a position in space that its projection in the plane of direction meets the writing line at the same slant. If instead of inclining the head to the left I *turn* it to the left, so that the right end of the base line comes forward, I can find out such a position of the base line in space that its projection in the plane of direction joins the slanting writing line anew.

We see that we reach the meeting point of the base line in upright writing without being obliged to turn or to incline the head sideways, and in slanting writing if the head is turned to the left or inclined to the left. Now observations on those pupils who write aslant show that the prevailing number have their head turned or inclined to the left, and the higher the class is, that is to say, the quicker the writing, so much more is that fact noticeable; from these facts we can conclude that there is a tendency on the part of the writer to give such a position to the base line, that its projection in the plane of direction becomes the same as the writing line; now if pupils incline or turn the head sideways it is a natural consequence that shoulders will follow suit; therefore upright writing would be the more desirable the quicker the writing becomes, because the influence of the slanting direction of the lines must then become greater. With the small abecedarians who write one letter after the other quite slowly, that influence cannot be a great one.

But the inclining of the head to the left can also be caused by another reason. If I sit in a correct position, but hold my pen too near the nib I cannot see what I am writing; therefore in order to see I incline the head to the left. For the abecedarians the manipulation of the pen is naturally less difficult if they hold the pen close to the nib, and therefore they often do so, and the origin of many bad positions can be traced to this cause, but very many are also due to the want of change of position, to fatigue, and to a lack of correct instruction at the commencement of learning to write, and to bad desks, as I said before.

What we have discussed seems to speak decidedly in favor of upright writing. Now writing is a unilateral occupation. If I rotate my forearm at the point where it touches the desk I describe a curve whose radius is given by the forearm and the hand on the desk; and if I rotate my hand at the point where it touches the table, I also describe a curve whose radius is shorter. Both those curves mount upwards from left to right,

and the chord of that curve shows the direction of the slanting writing line. Thus I can write a good part of the line quickly without much trouble. If I employ upright writing, that is to say, having lines parallel to the edge of the desk, I can only write quite a short piece quickly, because I must shorten the hand *itself;* after having written that short piece I am obliged to move the hand and forearm further and further along. Therefore, for quick work slanting writing is preferable.

The historical development of writing is characteristic. From old pictures, from initials in illuminated manuscripts in which the writer is depicted, as well as from old documents, it is to be seen that writing was formerly upright; from the beginning of the 16th century the change from upright to slanting writing is to be found in manuscripts, the probable reason being that the need of writing more quickly has given the impetus in that direction.

Less critical than writing is reading, because pupils can hold the book in their hands and can also prop it against the edge of the desk, and the body can lean against the back of the chair; it is more difficult to use the back in writing. I once collected primers from different countries, and I found no other primers so beautifully gotten up as to print, etc., as those from the United States. Very valuable investigations concerning the hygiene of printed matter have also been made.

I remember the investigations of McKeen Cattell, and of Sanford, which together with those of Javal throw much light on the subject. I apologize for not quoting American literature more frequently in my lectures.[1] As to school books, the late Hermann Cohn made many experiments regarding the legibility of print, and arrived at certain definite minimum demands as to the thickness of the strokes of letters, their height, the distance of one from the next, the distance of successive lines one from another, and so on. He constructed a simple apparatus by the help of which one can quickly find out whether a book is printed properly according to the norms of hygiene. A square is cut in a piece of cardboard, the side of which is one centimeter long and two adjacent sides are divided into half millimeters. Not more than two printed lines should appear at the same time in the square, if it is placed over a printed page, not more than seven letters in one of those lines, and so on. The directions for use are printed on the cardboard itself.

[1] Much literature on this and other subjects on School Hygiene may be found accurately quoted in the "Handbuch der Schulhygiene," by Burgerstein und Netolitzky (Jena, G. Fischer, 2d edition, 1902).

One might say that writing and reading and school-desks would be less harmful if young people had stronger muscles; for then bad positions in school or for school work at home would certainly be less injurious. But there cannot be any doubt that we must try to get the hygienic conditions of the schoolroom and work done in it as perfect as possible, not only in order to secure conditions conducive to health, but also to foster in children healthy habits and ideas, that later they may become public-spirited citizens, ready to help forward to the best of their ability all wise and broad-minded schemes for the furtherance of the hygienic education of the nation.

SOME REMARKS ON THE RELATIONS OF BODY AND MIND

By Prof. Leo Burgerstein, Vienna, Austria

The disposition and development of body and mind cannot be regarded as independent of each other, but the views concerning the importance of the relations in question have not always been the same during the progress of the human race, and in particular the ideas concerning the importance of the body as a receptacle of what is called mind have changed with the course of time. The standpoint of the moralist is different from that of the man of science, though neither will deny that the closest relations exist between them. While in a by-gone period of culture a harmonious development of the bodily and mental gifts has been regarded as the ideal of education, in certain phases of the Middle Ages in Europe the body was considered as an unworthy receptacle of the mind and it was extolled as a virtue to suppress as far as possible all efforts for the highest possible physical development.

Theoretically such a view is spurned to-day in all civilized countries by almost every one, but practically we suffer even now in different ways from the sad consequences of the singular ideas of a time fortunately past, and as we may hope never to return. Even to-day in Old Europe it is only by slow degrees that we approach the goal of an ideal education adapted to modern life and different climatic conditions.

Everything we do is necessarily connected with transformation of organic material, and there is hardly another organ which requires for its activity such a quick change of matter as the human brain does. It is a fact known to everybody that soldiers toward the end of forced marches continue to march in a state of sleep, so that in consequence of exhaustion the work of the brain is almost *nil*, but notwithstanding, in that unconscious state the muscles continue to accomplish movements whose total value, if measured in kilogrammeters, would be shown to be a big one.

Fatigue cannot be avoided, it is a physiological phenomenon, physiological that is to say within certain limits, and even the baby to whom no work is intrusted becomes tired and finds relaxation, nay, more than that, growth in sleep and nourishment.

One regards fatigue to-day as a result of change of matter, as a consequence of chemical processes, of a consumption of organic matter to liberate energy, whereby products of decomposition like lactic, carbonic acids and so on, are formed. These or more probably other products of change of matter operate with paralyzing effect upon the further ability to work; which could perhaps be developed anew by the consumption of still more organic material. Weichardt has at last found a specific fatigue toxin, the kenotoxin, which, according to his statements, exists even in the air exhaled, and he was also able to obtain the retardin as antitoxin to the kenotoxin.

I shall not waste your time with trying to criticise the different methods of testing fatigue, whether it is a question of psychological methods like those of reckoning, memory, combination-work, and so on, or whether it is a question of physiological ones such as the ergographical test or that with dumb bells and foot exercises, or Gilbert's tapping tests on a telegraph key, or those of measuring the changes in the acuteness of the senses like seeing, hearing, tasting, of the times of reaction, and so on; neither shall I speak about the relative applicability of the different methods for experiments under school conditions; only permit me to remark that, setting aside that question and that of the value of all those methods, it will be very difficult to arrive at conclusions of a general validity for educational purposes, because not only are the subjects taught so varied, the types of scholars so dissimilar, but also the teachers, preceding work, influence of suggestion, interest and so on are so different in every special case; and in addition to all these, the probable daily and yearly fluctuations in the ability of the organism, quite independent of work, will also influence the results.

If we add to all this the results when one method is controlled by the other, as in the observations of Thorndike or Ellis and Shipe, then we must acknowledge that we have many reasons for being cautious in generalizing from conclusions drawn from single experiments. Nor shall I quote the latest observations of American authors, which are probably well known to you, such as the valuable contributions of Burnham and Wells.

There can be no question about the fact that exercise of the faculties brings about better regulations of compensation, but it is of the utmost importance that work should not be continued until complete exhaustion ensues, and that it should be followed by the necessary rest. Certainly fatigue within physiological limits does not diminish the ability to perform work, and after the needed period of rest is at an end, ability increases

by the exercise of one's powers, but no skill is gained by work done in a state of fatigue; on the contrary it sustains a loss.

When fatigue increases to such an extent that it is no longer compensated for by the amount of rest which immediately follows, then for the young begins what we call "overburdening." Weariness as a subjective sensation of a general state of the organism is no measure of the degree of fatigue, but it is an important warning which should not be overcome by a strong effort of the will or by chemical stimulants. When tired children are obliged to continue work they instinctively rebel.

It is easily understood that these physiological principles are valid for bodily as well as for mental work. But it is very difficult to draw a sharp line in every single case between physiological and pathological fatigue, that is to say, fatigue pure and simple and overwork, and still more difficult to draw it in general, *e. g.*, for a school-standard; but in every case one can demand, in the interest of the healthy development of the young, that full time for repose be given from one day to the next, because it is of the highest importance that sleep should be sufficiently long and sound, since youth has not only to make good the loss of energy, but also to build, or store up a surplus of material for growth of body and mind.

Physiology has succeeded in proving accurately that certain qualities of brain-work are localized in certain areas of the cerebral cortex; it is to be hoped that further investigation may supply us with more of such facts, although for complicated mental work the task would be indeed a very difficult one. But in every case we shall be at fault if we allow the doctrine of localization to lead us to the idea of giving rest to the brain by change of work. On the contrary, we must bear in mind that considering all we know about fatigue as a consequence of the change of matter and of the accumulation of certain substances in the blood, it must be regarded as a general state of the organism, and that therefore the available local fund of energy is just as quickly exhausted. In extreme cases even common experience shows that clearly; if we are tired out by physical exercise, by a stiff mountain climb or walk, *e. g.*, we feel that we are not fit for hard mental work; and after being thoroughly tired with mental work, we certainly shall not be likely to recover by playing in a football-match.

There was a time, at least in certain parts of Europe, when it was proposed to augment corporal exercise for school children as a compensation for brain work, with the purpose of giving rest and recovery by that means; how unjust such an idea was is shown by all we know about physiology. Special investigations by different methods have also been made on school children, and all these experiments have shown the

same result. I shall only refer to one example from the interesting investigations of Teljatnik, of Odessa, who tested school girls 9 years old. The daily time-table was as follows:

Lesson 9 h. (Ist exp.) till 9 h. 55 min. . 5 min. recreation
——— 10 h. — 10 h. 55 min. . 5 min. ———
——— 11 h. — 11 h. 30 min. (IId exp.) 30 min. ———
(principal recreation time)
——— 11 h. (IIId exp.) — 12 h. 55 min. . 5 min. recreation
——— 1 h. — 1 h. 55 min. (IVth exp.)

The experiments were performed in order to test the condition of mental ability for work. The tests consisted of the following among other things: the ability to work out different kinds of sums, the ability to retain in the mind numbers and words and to remember numbers and words. I shall not go into details in regard to the ingenious method used, but only say that for judging the condition of ability for reckoning it was noted what percentage of all the calculations made were right and for the ability of retention and recollection, what percentage of the words and numbers were reproduced right. The average result of all these three tests Teljatnik called the "ability for work," and with these results we shall occupy ourselves for a moment.

It was the custom in the school for the girls to do what they liked in the long break; some of them jumped about and played for a longer or shorter time during the recess, others sat and talked, quite at their ease. Now on three of the days on which experiments were made every game with active movements was forbidden; on three other days all the girls were obliged to play such games.

The initial disposition of the children was naturally not quite the same each day at the beginning of the experiments, and the average results on the three days were as follows:

Ist exper.	79.6	. . . .	77.2
IId ———	72.2	. . . .	74.8
Main break without active games		Main break with active games	
IIId ———	76.6	. . . .	71.1
IVth———	73.8	. . . .	70.2

So we see that the average for the days without active physical exercise shows that the ability for mental work went up after the main break from 72.2 to 76.6, and on the days with active games the average fell from 74.8 to 71.1.

Now I find in the detailed tables of Teljatnik that on the three days with active movements the games lasted on the first of those days 10 min., on the second 23 min., on the third 20 min. If I look just at the IId and IIId experiment, that is to say the experiments before and after the long recreation, I find the following figures:

Without active games in the principal recreation time

	1st day	2d day	3rd day
IId exp.	71.5	74.5	70.6

Principal recreation time

IIId exp. 78.6 77.2 74.0;

On each of those days the ability for mental work rises.

With active movements in the principal recreation time

	1st day	2d day	3rd day
IId exp.	63.5	81.2	79.6

Principal recreation time

Duration of the games:	10 min.	23 min.	20 min.
IIId exp.	70.2	71.2	71.9

Here the ability for mental work goes down on the second and third day with 20 min. and 23 min. of active games, on the first day with only 10 min. of lively muscular exercise, rest from such exercise for a longer time followed, the result as to ability for mental work was no longer a lower but a higher one than before.

Here is shown by a pretty experiment of a single case, what we might expect *a priori*.

Mobility is a sign of health in children; they have a natural tendency to corporal movement; certainly if a healthy education is what we are striving for, we cannot possibly approve, from a physiological standpoint, of children sitting through a series of hours with no rests or only quite short interruptions. Even for boys and girls in high schools this practice is not to be recommended. It is necessary in every case that children should have rests between the lessons, in order to restore the want of balance in the muscular system, to improve the respiration which was retarded during mental work, to stimulate anew the circulation, because great blood vessels were unduly pressed by sitting, by bending the head, and so on, because active hyperæmia with sooner or later injurious consequences is caused by the continued mental work, and circulation is reduced by the superficial respiration. Even being obliged to sit for a long time on the seat which has become warm, is in itself unfavorable in certain respects. Therefore it is desirable that all scholars should have the opportunity of moving about even in the so-called "rests"—although on the other hand, it is clear that active movements of the great masses of muscles produce fatigue, which will not be favorable for the mental work to follow. Certainly we shall not give antidotes to the fatigue-toxin to the school children as a remedy, neither shall we make them chew cocaleaves, as the Indians of South

America used to do hundreds of years ago, when they performed the enormously fatiguing labor of traversing the Cordillera, in order to transport merchandise to the seacoast. If exhaustion of a store of organic material is marked by fatigue, and we endeavor to remove it by a specific anti-toxin, then the work would probably be done at the cost of further existing organic material; such a proceeding would be dangerous for any one who has to accumulate new material, although such drugs may be justifiably used in exceptional cases by adults, if urgent necessity should force them to do so. Neither can I approve of compulsory drill, which is already beginning to be in vogue here and there for scholars during a part of the short rests such as we have generally in central European schools. Drill exercises require energy of will and attention in every case, that is to say they employ the nervous centres in a large degree. For the *mens sana in corpore sano* it would probably be the best plan to interchange brain and muscle work more frequently than is done at present, but after every one of those exercises rest is needful. To find out the average optima for every age and every grade of schools in such matters would be a task for the experimental hygiene of instruction, but there cannot be any question as to the principle involved, and it was with a definite purpose that I recorded Teljatnik's experiments, to prove that there may be ways of finding out the best practical arrangements.

Then also in European continental schools the rests between the lessons are frequently spent in anything but a hygienic way. Often the children in the lower schools are obliged to sit in the schoolrooms during the breaks, or when they are sent out, especially in high schools, one may see pupils leaning on the walls in groups talking over their tasks, or stooping with their heads bent over their books, looking over lessons for the next school hour. It should also be a matter of education to teach the young how to rest as well as how to work.

I shall touch on another significant question in the relations of bodily and mental work. With regard to change of work and rest, it would certainly be a good plan to have part of the lessons in the forenoon, and part during the afternoon. This is more easily managed in boarding than in day schools. People are accustomed in many European countries to eat only a very small breakfast, and, in fact, children often have only a small cup of cocoa with a little white roll, then a heavier meal as soon as they return home from school. Now it is a physiological fact that there is a strong flow of blood to every hard-working organ; the consequence is that after such a dinner the intestines are richly provided with blood, and the brain is

by no means sufficiently nourished for its work. Everybody knows the corporal and mental lassitude which results from such a dinner; if one overcomes that feeling by an impulse of will, and works energetically, one notices that the digestion is impaired. Now the process of digestion in the stomach lasts for some hours after such a meal, and the total pause between forenoon and afternoon school is generally about two hours, during which time pupils must go from and to school. The pupils in high schools especially after dinner are already under the exciting influence of what is expected of them in afternoon school, but it is also a very usual thing for them to repeat immediately after dinner what they are likely to be asked in the afternoon lessons. Besides this, scholars often have to carry a heavy bundle of books to school, making the way still more burdensome.

During the afternoon's lessons which follow, both pupils and teachers struggle with the requirements of digestion. Now, I do not remember hearing such complaints uttered about afternoon lessons in countries where a good breakfast and only a small luncheon is the custom, and where dinner proper follows after the day's work. If I may argue from my personal experience as a man accustomed for many years to take a heavy breakfast, I think that one can work very well after such a meal in the early part of the day, for it would seem as if the organism is so much restored by sleep that brain and stomach can work at the same time without difficulty. The disadvantage of the arrangement described above goes so far that Schmid-Monnard found more sickly children in the lower schools in Halle, where afternoon lessons were the rule, than in other schools there, which had the same curriculum, but in which all lessons were given in the morning. This fact is to be explained also by the obvious reason that those pupils who have school in the afternoon cannot join as much in open air games as the others, because in the cities, during the short time remaining before the midday meal, no games can be organized. It is difficult to overcome these disadvantages, especially in high schools with their great number of lessons; the only way would be to shorten the lessons and the curriculum, so that a greater number of lessons could be gotten in before the dinner; but even now people do not everywhere realize that, in order to obtain something of real effect in matters of hygiene, concessions are often indispensable, and change in methods of instruction or similar means of reform alone cannot do everything.

Quite recently Burnham has dealt with the question of the daily sessions afresh, and quoted the American literature also.

Singular relations between body and mind may be found as a result of examinations of massed material, *e. g.*, in the final examinations in European high schools; a great deal of all that is taught during the 7, 8 or 9 years' course in the different kinds of high schools has then to be known all at once. It is a characteristic feature of those examinations that many years later they are the subject of nightmares. How intense these impressions must be to produce such results! It is only some years ago that I had the last of such dreams, I hope the very last, although it is nearly forty since I passed that final examination, and I feel sure that I am not at all an exceptional case. These dreams often worry people, although as far as memory work is concerned they have forgotten in the lapse of some months after the examination the greater part of all these details, so painfully accumulated for the purposes of examination. When a boy used to cram for such an examination, he not only spent whole days and the greater part of the nights for months in studying, but he was during the whole time in a state of tension, because he could not always test himself in all the memory work to see if he was sure of knowing it, and he was therefore kept in perpetual anxiety as to whether he was sufficiently well up in his subjects, to enable him to get through the examinations. By degrees the tremendous burden on the memory, entailed by such final examinations, is being somewhat disminished in Europe. Very interesting are the results obtained by the Russian Ignatieff, who examined the pupils in a military high school, where there are complicated examinations lasting for weeks, for the purpose of obtaining admission to certain special courses, which lead to a higher career. Notwithstanding a prolonged time for sleep and an improvement in diet, regular losses in weight were observed in the pupils, averaging about 4.5 lb. (over 2 kg.) during the course of the examination weeks.

After the examinations two months of fatiguing camp exercise followed, and then six weeks holidays; even after the holidays the pupils who had gone through the difficult examinations, had not regained their normal weight, even at the end of that period of rest.

The nervous tension, the excitement which accompanies the examination and impairs rest and sleep, influences the psychical sphere in such a manner that the physical development is damaged—possibly sometimes in an irreparable way.

Noteworthy also is the influence of psychical work as discovered by Key's investigations in the Swedish high schools. He stated from statistics that the actual amount of sleep becomes less with pupils of the same age in proportion as the standard is higher so that, *e. g.*, among the 15 years old pupils

52 per cent. of those who were in the third standard slept on an average 8½ hours, but only 14 per cent. slept the same number of hours among those boys of 15 years who were in the fifth school year—the standard which the school organization has intended for pupils of that age. Loss of such an important factor in development as sleep is must if continually repeated have bad consequences upon the young. How far schools sometimes are from understanding this fact is to be seen, *e. g.*, from the rules of one boarding school in Germany, a so-called "institute of education," where the highest rate of sleep allowed is six hours. That is a relic of the middle ages.

Key has also incontestably proved in the Stockholm high schools that the percentage of sickly pupils is influenced by the greater or less amount of school work done at home. He reckoned out the average time spent on home work by all pupils, then divided the pupils into two classes, one of them containing the pupils who worked over, the other the pupils who worked under that average time; those working over the average time showed 5.3 per cent. more of ailing individuals than the others—and that in a country where in general the number of boys with impaired health has been found to be a high one. Similar results were obtained from analogous observations in a number of other small Swedish towns and in Kopenhagen.

It is, however, to be presumed that in moderate climates the meteorological influences which are continually changing during the year are not without effect. I could prove from the Vienna children's hospital statistics that the curve of morbidity becomes higher from September until about the end of March, and goes down between April and September. It is also a matter of fact that augmentation of weight has its phases in the lapse of the solar year; it would not be surprising if such reasons did not affect the sum total of mental ability also. We all know the investigations of Porter of St. Louis on 33,500 boys and girls. He inquired "whether dullness and precocity are associated with a physical variation from the mean so palpable that it can be recognized by the coarse methods of investigation practicable in school work." His figures show that pupils of a certain age are heavier and taller when found in the higher standards. I shall not go further into details, but every one who reads the results is inclined first of all to doubt their validity.

I was not able to make a similar investigation, but I have published in German a somewhat lengthy critical survey of the matter, and that induced Schmidt in Bonn to make a fresh investigation on 4,000 children, to confirm the results already

obtained. Further publications followed in Germany such as those of Graupner in Dresden, who obtained incidentally the same results from another independent investigation on about 57,000 children; Samosch in Breslau, published an investigation upon about 2,000 children; in Berlin 20,400 children were tested; Bayerthal made investigations on soldiers and school children; in Austria Quirsfeld in Rumburg; Igl in Bruenn, and Rosenfeld in Vienna made contribution in various ways. In Antwerp Schuyten made investigations with the dynamometer. In the United States Christopher and Smedley tested thousands of children with the ergograph and dynamometer; Carman found bright boys and girls in general physically stronger than dull ones. W. S. Cornell examined Pennsylvanian children in different ways, and I. E. Bryan tested 10,130 Camden children; from these investigations it is also to be seen that there is a connection between physical defect and backwardness in learning. Gilbert, however, studied Iowa and New Haven children, and Boas Toronto children; they did not, however, draw their conclusions from the advancement in standards, but from the teachers' impressions of quick intelligence in the children and could not prove a permanent relation between physical development and mental ability.

In England Clouston and Shuttleworth, in America Dawson and Tarbell, and in Germany Schmid-Monnard have made observations upon defective children in particular. It is a well-known fact that children who are mentally inferior are also less capable of resisting sickness, and that their death rate is higher than that of normal children.

It was intentionally that I quoted, although only in a cursory manner, this long series of investigations, because the sum total in almost every case shows similar results, namely that as a rule children with a higher physical endowment surpass in physical ability also, those endowed with lower physical gifts.

Naturally the physical status of the organs of the higher senses must have great influence upon mental development. Kerr in London studied about 1,400 boys and 1,400 girls, who were divided into two groups, precocious children, that is to say, those who were younger than the average age of their standard, and backward children. The backward ones show in every year of the ages which were examined for statistic purposes a higher percentage of children defective in vision than do the precocious ones.

Striking single cases are also known that illustrate the connection between physical and mental development; a Berlin school girl of 14 years of age, *e. g.*, was thought to be deaf; but after the adenoids from which she had been suffering had

been removed, the girl heard, but her mental development was only equal to that of a child two years old.

Gulick and Ayers found from their investigations in 15 schools of New York City that physical defects decrease with age; they say themselves "that the higher grades are to a certain extent made up of the survivors of the more fit," a fact which shows the great importance of the physical state upon mental development; but the authors find also that a consideration of probably "far greater weight is that children do actually outgrow their defects."

If we consider all these investigations and criticisms very carefully we may come to the conclusion that inferior physical gifts and development, as well as the existing of physical defects, will as a rule be followed by a lower physical condition, and therefore by small success in the school career, where so much depends on brain work—even if we are not far enough advanced to say with certainty how largely psychical inferiority is accounted for by physical inferiority, and how far ill success in education is everywhere due to this cause. But as a vigorous condition and development also influences future generations, it would be a matter to be regretted if the results of education itself as regards health were unfavorable to the higher development, since public education influences the people in every land more and more, and its results also in a physical direction must be of growing importance to every nation, and consequently to the whole human race—which is the greatest proof of the importance of school hygiene.

Our knowledge is added to like a mosaic piece by piece, and sometimes we imagine we have found the right piece to be put on a certain place of the mosaic, and alas! we find we are mistaken. Besides which, some results of investigation have a general significance, while others are influenced by local circumstances; we are far from seeing clearly in every direction, but so far as we can tell, mental work as one of the most complicated functions of the body, is not quite inaccessible to accurate investigation, and therefore we may expect further progress still in that direction, and we are entitled to suppose that the best methods of public education are of value to mankind in many different directions. But as exact knowledge only grows by degrees, then you must forgive me if what I have said in this lecture has been like the dissolving view of some disjointed pieces of that mosaic, to which we are each of us trying to add our share.

THE RESPONSIBILITIES OF THE TRAINING SCHOOL FOR TEACHERS IN MATTERS OF HYGIENE

By Thomas A. Storey, M. D., Ph. D.
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The training school for teachers has, I believe, three obligations to support in the matter of hygiene. First: It should make its environmental influence safe, sanitary, and hygienic. Second: It should turn out graduates whose physical influence is hygienic. Third: It should supply the school child, through its graduate teachers, with such information and experience as will lead him to become a factor in the solution of the health problems of humanity.

The first obligation is the obligation common to all institutions whose peculiar influences operate for any period of time upon the health of human beings. All such institutions are under a serious obligation to make those influences safe, sanitary and hygienic. The Training School for Teachers should support this obligation in the selection of its building site, architectural plans and material equipment; in the selection of its system of water supply, plumbing, heating, lighting, ventilation, sewerage and cleaning; in its provisions for the proper and adequate exercise of the fundamental health habits of the individuals under its institutional influences, through attractive and easy opportunities for physical exercise, recreation, rest, cleanliness (including bathing and care of the excretions), and for bodily nourishment. The Training School should further support this obligation through a careful exclusion from its student body of all individuals whose physical condition would be a menace to the health of their associates.

This first obligation is met by the employment of sanitary and hygienic experts for the selection of the building site, the architectural plans, the fixed and other material equipment, and for the supervision of certain phases of institutional administration; and by the employment of expert medical and hygienic service for the examination of candidates for matriculation, and for the inspection and examination of the student at appropriate intervals during his stay in the school.

This first obligation has to do primarily with the safety of the individual in the Training School. The second obligation which I wish to point out has to do primarily with the safety

of the school children with whom the Training School graduate may later come in contact. I believe that you will agree with me that the Training School for Teachers must employ every reasonable means to escape the graduation of teachers whose physical condition would be a menace to the health of their pupils. The exercise of this care is the second obligation which, I believe, the Training School for Teachers should support. The penalty for hygienic neglect in the Training School may be paid by the later sacrifice of the health or even the life of the school child.

This second obligation is partially met by those measures applied for the satisfaction of the first. If the first is adequately supported, the support of the second will be simplified. If the institutional influences are safe, sanitary, and hygienic and if the individual has brought no latent disease with him, his physical condition on graduation from the Training School will be good. He will at least be not likely to contract disease while under ideal institutional conditions. But it is one thing to be well and another thing to be healthy. I believe this obligation of the Training School for Teachers does not cease when all the external institutional influences have been made properly sanitary and hygienic. The teacher should not be merely well. He should be actively and aggressively healthy. His tissue cells should be ready to furnish on demand any of the protecting immunizing physiological products that defend the vigorous, healthy human being from disease. This protective resource resides in the tissue cells of the human body. Science teaches that this function is more efficient when the tissue cells are properly exercised, adequately rested, well nourished, and clean. We secure these influences on the tisssue cell through the various proceedings that are included in physical education, or physical instruction, or physical training, or personal hygiene, or applied hygiene, or school hygiene, or whatever you choose to call the scheme of daily life which exercises the body, rests the body, secures its nourishment, and keeps it clean inside and out. I would then insist that the Training School for Teachers in order that it may graduate strong, vigorous and healthy teachers (this is my second obligation) should, in addition, give such instruction in the various subjects connected with the acquisition and conservation of health as will enable the prospective teacher to formulate *and apply* an intelligent policy of personal health control. Such a teacher is not likely to become a menace to the health of his pupils. Incidentally, he is more likely to become a success as a teacher.

The first obligation which I have cited is supported in the interest of the health of the individual for his own sake; the

second obligation is supported in the interest of the health of the individual for the sake of his future pupils. The third obligation which I wish to present is supported in the interest of the individual because of his probable influence upon his future pupils, and through them, on society.

I would state this obligation as follows:

The Training School for Teachers is under obligation to give such instruction as will enable its graduates to become successful teachers of hygiene.

In order to support this obligation adequately, the Training School must give its students instruction and practical work in general hygiene with special attention to those phases of hygiene that have to do with school and home life of the child. The teacher's equipment would then include a knowledge of the fundamental facts which form the scientific basis of hygiene, and it would also include ability to apply these facts to the life of the child in the recitation room, exercising hall, playground, study room, and other divisions of the school and home. This would include the instruction we now give under such names as General or Elementary Hygiene, School Hygiene, Personal Hygiene, and Physical Education.

I insist upon the importance of this obligation of the Training School to prepare teachers of hygiene for various reasons. The world's wisest and greatest educators, have agreed, so far as I have been able to discover, that the sound, healthy body is of first importance in the education of the human being. The academic objects of the school curriculum are more satisfactorily realized if the pupils are healthy. If, then, the Training School gives its graduates successful instruction concerning the facts that regulate human health, it is supplying those graduates with a means for securing better scholastic work from their pupils.

In addition, it is our business to turn out efficient grammar school, or high school, or college, or university graduates. The graduate without health is a graduate with a limited efficiency. The healthy grammar school, high school, college, or university graduate is worth more to himself, worth more to his community, and worth more to his country because of his health. The baker, the butcher, the motor man, the business man, the farmer, the banker, the lawyer, the physician, the teacher—every man in every activity of life draws his vitality, his vigor and his endurance from his store of health; and upon his good health he builds his domestic, business, professional, religious, or academic success.

And again, the Training School for Teachers is under obligation to produce graduates equipped to teach hygiene successfully because of the unique opportunities the Training School

has for educating the masses. Every teaching graduate of the Training School becomes a radiating point from which the educational influences of the Training School emanate in every direction. In his contact with, and influence on, parents and children, the teacher secures an opportunity which is found nowhere else in human affairs. This opportunity should be used in the interest of the common weal.

Disease is the penalty we pay for hygienic ignorance. We are ignorant nowadays because we are not taught. There is knowledge enough but it has not reached the masses. Every school child should know the simple ways and means of securing and conserving health; he should know the detrimental health influences of abnormal conditions and habits. Every school child should be forming proper health habits. Every school child should spend his school life under proper conditions of school hygiene. Every school child should learn before he leaves the school the main facts concerned with the causes of disease, the carriers of disease, our defences against disease, and the nature of our common diseases.

If the hundreds of thousands of young men and women who graduate from our grammar schools and high schools each year could carry with them an accurate knowledge of these subjects we would, in a few years have no native born parent ignorant of the fundamental facts of hygiene. The difficulties that now oppose the progress of hygiene in the school, in the home, and in the city and state would largely disappear. We would ultimately become a stronger, more vigorous, and more efficient race, better able to realize the higher ideals that make human life worth the living.

THE INSTRUCTION OF TEACHERS IN SCHOOL HYGIENE

By Guy Montrose Whipple, Ph. D., Cornell University

It is unnecessary for me on this occasion to dwell long upon the importance of instruction in hygiene. I hold it to be self-evident that every teacher and every child in our schools has the right to health, that when the state makes schooling compulsory, it thereby engages itself to provide that schooling under sanitary and healthful conditions. I hold it to be equally self-evident that no teacher can render to the community and to the pupils in his charge the best service of which he is capable, if he is ignorant of his own rights to health and careless of those of his pupils. On this account alone, instruction in the hygiene of the school environment is an essential part of the teacher's preparation.

Again, we live at a time when the problems of health are more and more engaging public attention. The fight against tuberculosis, the crusade for clean milk, the playground movement, the introduction of medical inspection, pure food legislation, agitation for the enforcement of tenement-house laws, the popularization of medical knowledge in magazine literature, —these are but a few of the activities that betoken present-day progress toward better personal and civic health. Teachers, then, need instruction, not only in those special phases of hygiene that relate to the school environment, but also, to the end that they may teach health more intelligently and preach health more enthusiastically, in the general principles of public health and sanitation.[1]

[1] At the Second International Congress on School Hygiene, at London, 1907, this resolution was adopted:

Whereas the improvement in the health of, and the hygienic conditions surrounding, school children depends largely upon the intelligent co-operation, the competency, the interest and the faithfulness of teachers and principals in matters of hygienic importance, therefore be it *Resolved:*

That all schools having courses for the training of teachers should give instruction in (*a*) personal and school hygiene, and (*b*) the principles and practice of physical training. And that to each of these subjects should be given as much time as to the major subjects in the course.

That practical and theoretical instruction in personal and school hygiene should form a regular part of the curriculum of all institutions in which students are trained to become teachers in schools of all grades.

Granted, then, that instruction in school hygiene should be a fundamental feature of the training of teachers, a number of questions arise. Are such courses commonly given to teachers at present? How can the introduction of such courses be encouraged or assured? How can teachers in the field be instructed? What should be the length of the course? What should be the nature and content of the course? These questions I shall seek to answer so far as my time will permit.

(1). *Are courses in school hygiene commonly given to teachers in training at the present time?* I believe that I am correct when I say that instruction in school hygiene is not a regular, nor even a common, feature of the training of teachers in the United States.

I base this conclusion in part upon personal contact with teachers. So often have I been amazed at the lack of knowledge of the most elementary principles of school hygiene that well-intentioned superintendents and teachers may exhibit. Teachers in training may be excusable when they ask: "Why should I take a course in school hygiene? It's just something about measuring desks, isn't it?" But those who have been responsible for their training should be ashamed to have teachers in the field ask, as I have heard them ask: "Why should I need to know anything about medical inspection?" or "When shall we hear the end of this eye-glasses fad?" or "What's this silly fuss about adenoids?" or, as in one instance reported to me: "Why should I keep Johnny Smith out of school? I don't believe that scarlet fever is catching, anyway."

I base my conclusion, also, upon a somewhat hurried survey of the catalogues and courses of study in some 35 normal schools and college departments of education. I am informed that the Bureau of Education is now collecting statistics of the number of institutions that offer courses in school hygiene; until these figures are published, one must avoid more positive generalization. It is, however, safe to say that we are outranked by European practice in this particular. In Scotland, for example, the joint committee of university training centres provides that "the course of professional training shall include attendance at an approved course in personal and school hygiene, to extend over a period of two terms of at least ten weeks each, and to include 30 to 50 hours' instruction." This instruction, it is explained, includes not only lectures, but also visits to schools and study of their equipment from a hygienic point of view, together with practice in the physical observation of children and in the conduct of tests of sight and hearing.

(2). *How can the introduction of courses in school hygiene into the curriculum of professional training schools be encouraged and assured?* To this query I can only make a few suggestive proposals. I propose (*a*) that the heads of departments of education in our colleges and the principals of our normal schools collaborate in devising ways and means of introducing such a course, (*b*) that the need of the course be presented in educational journals, before teachers' institutes and state teachers' associations, (*c*) that the need of the course be brought as forcibly and as clearly as possible to the attention

of state superintendents of public instruction,[1] (*d*) that the American School Hygiene Association lend its aid to the movement, and (*e*) that the Bureau of Education at Washington lend the weight of its authoritative support by publishing appropriate bulletins and by otherwise promoting the introduction of this work.

(3). *How can school hygiene be taught to teachers in the field?* This question possesses perhaps even greater importance than the preceding one, since the number of teachers in the field is greater than the number in training, and since they can be less easily reached or affected by the adoption of new regulations on the part of the governing boards that control our training schools. A possible solution of the question has come to me recently through conversations with a number of school superintendents. I find that many superintendents, who are firmly convinced of the need of holding periodic teachers' meetings, are at a loss to know what is best to do with these meetings when they are held. Why, now, should not these superintendents take up the study of school hygiene with their teachers? The subject seems to me well-nigh ideal for this purpose; for, as we have seen, many teachers sadly need this knowledge; it has unquestionably a direct and immediate bearing upon their work; it concerns teachers of all grades from the kindergarten to the high school; and it offers unlimited scope for study, though returning value from even a limited expenditure of time and effort.

More specifically, I suggest that the school or public library be equipped with the best texts in school and personal hygiene, and that the superintendent assign topics for discussion at each meeting. These meetings may be devoted to formal papers by different teachers, to lectures by physicians, health officers, eye and ear specialists, university or state-department authorities, or to informal discussions led by the superintendent or his principals.[2]

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[1] The aim should be, of course, to obtain official recognition of school hygiene as an integral part of the required course of training in all the normal schools, training classes, and schools of education that are under state supervision or control. In New York State, to illustrate present conditions, the Department of Education at Albany issues a syllabus which prescribes in some detail the professional courses (history of education, psychology, etc.) that must be taken in the universities, or passed in state examinations, before certain certificates are granted to college graduates. Since school hygiene is not specifically mentioned in this syllabus, the subject, when given at all, is, perforce, given as an elective course only.

[2] The possibilities of this plan have so appealed to me that I have prepared a small guide book (*Questions In School Hygiene*, published by C. W. Bardeen, Syracuse) with special thought of its use by bodies of teachers in the field, as well as by classes in institutional courses.

(4). *How much time may, or should, be spent by teachers upon the study of school hygiene?* For teachers in training, a course of 30 hours (classroom meetings) is to be regarded as a minimal expenditure of time. If the students have a fair knowledge of physiology, and preferably, too, of psychology, this time is, I think, adequate for the assimilation of the general principles underlying the subject. Because, however, of the fact that school hygiene is peculiarly a subject that exacts specific knowledge of a large number of details, it is possible for advanced students or graduate students to carry their study much farther with corresponding advantage, especially if drill or research 'practicums' can be arranged.

(5). *What should be the content of the course in school hygiene?* Without wishing to put stress upon the order of presentation, I would include in a course on school hygiene at least the following main topics, or groups of topics: (*a*) the schoolhouse site and grounds, (*b*) general principles of schoolhouse construction, (*c*) the form and size of the classroom, (*d*) the illumination of the classroom, (*e*) school furniture, with special reference to desks and chairs, (*f*) heating and ventilating, (*g*) sanitation (in the narrower sense), (*h*) the hygiene of vision, (*i*) the hygiene of reading, (*j*) the hygiene of writing, (*k*) the hygiene of the ear, (*l*) the hygiene of the mouth, throat and nose, (*m*) school diseases and accidents, (*n*) medical inspection, and (*o*) miscellaneous topics, such as growth, instruction in sex hygiene, fatigue, overpressure, rest-pauses and the school programme, sleep, exercise, diet, and clothing.

Allow me, if you will, to add some words of comment and explanation.

Teachers not infrequently express the feeling that the study of schoolhouse construction (site, illumination, heating and ventilating, etc.,) is unnecessary for them, since they can have no direct share in the erection, or even in the equipment of the building. This view is surely unwarranted; the teacher should look upon the school building and its grounds as his immediate

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As the title implies, this book takes the form of a series of questions; these questions are grouped under appropriate classificatory heads and prefaced by page or chapter references to a number of standard books. With the questions before them, the teachers are not confined to any single text-book, but can draw upon numerous sources for their information, especially by following the suggestions for supplementary reading that have been embodied in the guide. This method, I am confident, will enable superintendents and teachers to undertake the study and application of school hygiene with profit and advantage both to themselves and to the children in their charge. Lectures by local talent could be secured in almost any community, and it might not be impossible to enlist the interest of mothers' clubs, child-study clubs, and similar organizations, whose purpose coincides, in part at least, with that of the organization of teachers.

professional environment, and he should know how to make the most effective use of this environment, whether good or bad; he should also have clearly in his mind the possibilities of ideal schoolhouse construction, so that he may understand in what ways his own building might be improved, so that, if, as not infrequently happens, extensive alterations are made in old buildings or new buildings are erected, he may be able to make helpful suggestions, and to request, if not to demand, those things that he knows are possible and desirable.

So far, too, as illumination, heating, and ventilation are concerned, these are matters that continually demand technical knowledge of the teacher.[1] I would, accordingly, give careful attention to these phases of the course in school hygiene; I would ensure real comprehension of sanitary building construction by the use of abundant photographs, charts, and other illustrative material, and by directing members of the class to visit and report upon the construction and equipment of school buildings in actual use.

Much the same comment may be made with regard to the study of school furniture. I cannot accept the statements made by some persons that "there is nothing in the school desk problem." Here, again, a study of the actual seating of children, supplemented by the exhibition of photographs, models, and samples of various desks, with practice in adjusting desks and chairs to pupils, will show the reality of the seating problem. Special attention should also be paid to the teaching of corrective exercises, *i. e.*, exercises on the order of the 'setting-up' drill that will counteract the evils of bad desk habits.

Under sanitation I would include a study of the general principles underlying the operation of different systems of sewage disposal, of the problem of pure drinking water, of the need of school lavatories and baths, and especially of the best methods of mitigating the dust nuisance, with reference also to the rules that should govern the work of janitors in sweeping, dusting and cleaning the school building.

The study of the hygiene of reading and of writing should be approached from the study of the hygiene of the eye. Students should, therefore, first be made thoroughly familiar with the mechanism of accommodation, and should understand

[1] Thus, for instance, in the course of a thorough study of the sanitary condition of a certain grammar-school building, I found that, although the building was an old one and confessedly poorly built and equipped, it was plain that the teachers were not getting the best use of the heating system that was installed, and that they were neglecting to adjust the window shades or seat the pupils so as to utilize the light that was available.

the genesis and the methods of testing and of correcting (in so far as this is possible) such defects as myopia, hyperopia, astigmatism, color-blindness, and the grosser forms of ocular imbalance.

The hygiene of writing should reveal the far-reaching importance of the writing posture, and this should lead to an understanding of the relation of different systems of writing to bodily posture, and of the duties and responsibilities of the teacher in overseeing and developing proper habits of posture.

In the study of the ear, as in that of the eye, it is imperative to make clear the operation of the organ itself, to convince teachers of the intimate relation between sensory defect and school efficiency, and to practice them in conducting sensory tests in an accurate manner. The limitations and sources of error that inhere in these tests must not be disregarded.

Similarly, general knowledge of the anatomy and physiology of the mouth, nose, and throat is a prerequisite to the study of the hygiene of these important structures. Models, diagrams, and even dissected specimens, should be brought into the classroom, and practice should be given in the inspection of the buccal and nasal passages in children. Needless to add that special emphasis must be laid upon the serious and far-reaching consequences of adenoids and defective teeth.

School teachers cannot be expected to have a thorough technical knowledge of the so-called 'school diseases,' but they can be expected to be thoroughly familiar with their symptoms, and, in a general way, at least, with their causes and consequences. More particularly, they should know what preventive measures may, and must be, taken to avoid the outbreak of epidemics and the spread of infectious diseases. This knowledge may profitably be summarized by each student for himself in the form of a table that shall indicate (*a*) the cause, (*b*) the symptoms, (*c*) the period of invasion, (*d*) the period of incubation, (*e*) the period of infection, (*f*) the length of quarantine, (*g*) the complications to be feared, and (*h*) the teacher's duties, with respect to diphtheria, whooping cough, measles, scarlet fever, chicken-pox, smallpox and mumps. All teachers should be in a position to give instruction in the origin, symptoms, prevalence, outcome, and treatment of tuberculosis, and should understand clearly the nature and importance of bodily resistance to infection from it and from other infectious diseases.

Of the non-contagious diseases and defective conditions, I would require general knowledge of scoliosis, chorea, epilepsy, and feeble-mindedness.

Ability to handle the more ordinary types of school accidents, such as nose-bleeding, burns, sprains, fainting, and even the more serious accidents, such as bleeding from cut arteries and

veins, broken limbs and drowning, may be acquired without much difficulty, so far as verbal instruction can avail

The course in school hygiene cannot neglect the discussion of medical inspection, since teachers must be led both to encourage the adoption of the system in their own schools and to co-operate intelligently with nurses and physicians, when it has been introduced.

There remains, finally, a group of topics that I have referred to as miscellaneous topics; but they are not on this account of little importance. I have in mind the hygiene of growth, rest, sleep, fatigue, exercise, instruction in sex hygiene, and questions relating to diet and clothing.

The study of normal growth leads naturally to a discussion of physical, and hence of mental, retardation, with reference to its causes and treatment, and to its effect upon school work and progress.

Although we are far from full scientific knowledge of the complex condition termed fatigue, we can, nevertheless, familiarize teachers with its more patent symptoms, and can discuss with profit the optimal adjustment of the school programme (order of exercises, time of taking up different subjects, number, length, and nature of recesses, and other rest-pauses).

I deem it self-evident that every teacher of school hygiene must give his students a frank and objective talk upon the sex-hygiene problem, and that he must encourage them to work out the solution of instruction in sex hygiene with perseverance and tact.

The programme that I have sketched, ladies and gentlemen, is doubtless incomplete, and it is certainly open to revision. The detailed elaboration of any course of study requires more time and experience than has yet been our lot in the teaching of school hygiene. But that the general principle upon which this programme is based,—the necessity for accurate knowledge on the part of every teacher of the fundamental facts of school hygiene,—is correct, I have no doubt.

The teacher holds a strategic position; he controls in large measure the environment and the formation of habits and ideals of the coming generation. With the teacher, therefore, rests the possibility and the hope for progress in health and for the attainment of that happiness which good health alone assures.

RESEARCH IN SCHOOL HYGIENE, IN THE LIGHT OF EXPERIENCES IN AN INSTITUTION FOR THE FEEBLE MINDED. Abstract

Henry H. Goddard Ph. D., Vineland, N. J.

It may be a surprise to some that this subject is to be discussed by one who is working with imbeciles and idiots. But I can assure you that in one institution at least there is a most unique opportunity to make researches in School Hygiene as well as in many other lines.

Some four years ago a great man conceived a great idea. The superintendent of an institution for the feeble minded had for some time been asking himself what justification could society find for the large sums of money it was expending on its defectives.

His conclusion was that there was no justification for more than a reasonably comfortable living unless society received some return. What return can it receive? The greatest in the world! Here are hundreds of unfortunate beings whose condition cries out to be investigated. We have these children under ideal conditions for studying them and their problems.

An institution for defectives should be a laboratory for scientific research into the condition and causes of the thing which has made the institution necessary.

That is the great idea! Supt. Johnstone is a man to whom the thing that ought to be is the thing that must be. Therefore when he had evolved that idea he said to a group of thoughtful men who had assembled to discuss some of the larger problems in an informal way, "Gentlemen, I have the money to run a department of Research for a year. Tell me where I can get a man."

It would have been impossible to have found either cash, collateral or promises to back up that statement. Nevertheless it was a true statement, when one understands just what sort of commodity it is that makes possible the greatest human achievements. It is faith. Superintendent Johnstone is a practical optimist. He is like Francke, who founded the Institutions of Halle on a few florins and an abundance of faith. Only Johnstone did not have even the few florins. He had the conviction that the thing ought to be done—and he did it. The money came. Enough for that year; enough for the second

year and enough for the third year. And it will come for all the rest.

Here is the opportunity: nearly four hundred feeble minded boys and girls (many of them men and women in years) to whom nothing but good and happiness can come from a scientific study of their cases. Here is a superintendent and Board of Directors who are so wise that they believe that eyerything should be done to facilitate such research work.

Under these circumstances we have laid out a rather comprehensive plan which I cannot now detail to you.

You will now understand that in connection with the carrying out of this plan I have collected the data which constitute what little contribution I may be able to make to this discussion.

One of the first things we did was to try to determine the growth curve for mental defectives. We have the measurements of some eight thousand children. We have divided this according to the grade of the child into high grade or nearest normal, middle grade (imbecile) and low grade (idiot) and plotted the growth curve for each group. This is the result:

The idiots are farthest below normal in both height and weight, and at the age of nine years they begin a still greater deviation from normal, and as the years go by fall steadily more and more.

The imbeciles are a little below normal all the time and at the age of fourteen begin their increasing deviation or drop from the normal curve.

Lastly the high grade curve is practically coincident with the normal up to the age of nineteen, when the feeble minded boy stops growing while the normal boy goes on until 23 years of age.

This is for boys. The girls' curves show the same thing to a certain extent, but the course of the curve is interfered with by another factor.

Recall, if you please, the pubertal acceleration where the girls' curve crosses the boys. If now you imagine the curve of our feeble minded girls drawn in you would see it taking its up-shoot a little later than with the normal but going much higher, so that we have the surprising phenomenon of feeble minded girls growing much faster and being heavier and taller from thirteen to fifteen years of age than the normal girls.

If now we seek for conditions to explain this we are met with the following considerations:

The feeble minded girls in institutions, upon whose measurements these curves are based, live according to hygienic prin-

ciples. They eat plain, wholesome food at regular times and in proper quantities. They have abundance of sleep also at regular hours. They have much play and exercise in the open air. They have nothing to worry them. Their heredity is poor.

The normal girls are quite different. It must be remembered that all our statistics are based on school girls and that the girls who are still in school from 13 to 15 are of the better class socially. Many of them are in the high school, many of the rest are preparing for it. They are not generally living under hygienic conditions. They are beginning to enter into social life; are often out rather late at night at parties, etc., thereby interfering with regular sleep and not infrequently getting too little sleep. They are eating, as a rule, more fancy food, much candy, and on the whole a far from satisfactory diet. Add to this the weight of their school work with its worry and anxiety, and we have a picture the very opposite of the other one. And these children have good heredity.

Now in view of these facts, it would seem as though the feeble minded group, living under good hygienic conditions, was more likely to give us a normal curve. In this event we should have to conclude that the usual pubertal acceleration is not as great as it ought to be, but is actually retarded by the relatively unhygienic lives of our girls at this period.

If the interpretation be correct, it surely points to a radical change in our treatment of the adolescent girl both in school and at home.

OPPORTUNITY AND NEED FOR RESEARCH WORK IN THE HISTORY OF EDUCATION

By Paul Monroe, Ph. D., Teachers College, Columbia University

As educators we are concerned with two factors which effect the advance in our educational activities; one is the improvement of practice; the other, the increase of knowledge which furnishes the basis for that improvement in practice.

It is unnecessary to argue that there can be no improvement in practice without such an increase in knowledge; and unnecessary, in a body of scientific students, to urge that any increase in knowledge, no matter how remote and recondite, has an ultimate bearing of a practical character in that it will affect conduct or practice when such knowledge is given its proper setting.

It is to be regretfully admitted, however, that the same cannot be said of all university groups, so far as our own subject is concerned. For we have to confess to a very general skepticism on the part of university faculties and of the departments of long standing, concerning the possibility of the scientific study of educational activities, either of exact, comparative or historical character, and a disinclination to any obligation on the part of the university towards educational practice outside of university instruction itself. No doubt both this skepticism and disinclination to admit obligation are due to the non-scientific character of prevailing educational practices and to the paucity of results of such scientific studies as have been made: hence, both the need and the opportunity for such work as our topic indicates.

Increase of knowledge is to be effected in two respects: (1) in the higher level of intelligence on the part of the rank and file of the practitioners of our profession. This in reality concerns the professional training of teachers, or rather *is* the professional training of teachers. The dissemination of knowledge concerning our professional activities is a function of our universities and colleges as well as of normal and training schools, possibly also of our secondary schools. That this should be so has been the argument of enlightened educators, in the English speaking race, from the time of Mulcaster, Brinsley, and Francis Bacon. Bacon termed the educational process "tradition";—that process by which one generation

hands down to the succeeding one, those practices, customs, ideals, achievements which it considers to be of value;—and argued that the study of tradition should find a place in every university. But because education *is* tradition, it tends to be hampered by the inertia of social institutions beyond most other aspects of social life that have come under the ægis of special professional classes.

So we have awaited our own day to find a tardy, reluctant and partial recognition of the obligation of the university to society in respect to this phase of institutional activity which is most essential to present social welfare and to social progress.

But this aspect of our subject is to have special consideration in to-morrow's conference.

That phase of our topic which we have for special consideration to-day relates to the second aspect of the increase of professional knowledge: namely, the actual enlargement of the bounds of knowledge concerning that phase of social activity which we term education. There will be little or no aversion on the part of university authorities or of university men, in whatever line they may be, to the incorporation of such study within the range of university work, so long as the need and opportunity for such can be indicated and some actual achievements demonstrated.

Scientific investigation of the phenomena of education falls into a variety of fields; that using symbolical or logical methods, that using experimental methods and that using comparative methods,—the three great scientific methods. The logical or symbolical method has long been used; and the development of the philosophical treatment of education,—the formulation of the theory of education,—has received the attention of acute minds on many occasions for many centuries. The chief contribution of the German students during the 18th and 19th centuries were along these lines. And there promises even now a revival of interest along this line, stimulated no doubt by the progress in allied lines by the use of the experimental and comparative methods based upon the progress of physical, biological and sociological sciences. The progress of the 19th century in the field of educational thought and practice was chiefly due to the use of the experimental methods, essentially in the field of psychology.

The application of comparative methods to educational data, as in the field of historical and sociological phenomena, is the most recent development. It must be confessed that little progress has been made as yet. One phase of this new development of scientific study of education by comparative methods, namely, that in the field of historical data, is the special subject of my brief discussion.

Naturally the development of such study in the educational field follows a long way after its development in other aspects of historical phenomena. But as the centre of interest has shifted from the old political, military and dynastic aspects of social life, or at least the interest has broadened to take in other phases of life no less important, though somewhat less definite and tangible, this development has gone on apace.

For the most part such work as has been done of critical value, of any great importance, has been conducted as a phase of the study of culture, with no special interest in education as a formal process. It is the university as an institution, or the development of some special field of knowledge as a part of the general growth in intelligence, that has been studied; not the actual formal process of the transfer of knowledge from one generation to another, or the dissemination of information and technical ability, or the effort to secure social progress through attractive rather than compulsory force. Now, however, there seems to be developing some genuine interest in the scientific investigation of historical phenomena, that may be classified as educational in the more restricted sense.

Our main interest is in the opportunity and need for such work. Both the opportunity and need can be made somewhat clearer by a brief consideration of what has been done.

The summary is very brief so far as English and American contributions are concerned. The history of universities has always commanded the interest of a few of their sons and such records have been more or less critically examined by students. But it has awaited the work of Mullinger, now a generation ago, or more especially that of Rashdall, for any genuine scientific investigation. Recently, however, we are reaping the fruits of the establishment of chairs in education in universities of Great Britain, in the work of Woodward, Watson, Adamson, Montmorency, Leach, and others. We have no work to compare with this in America.

Outside of a few theses, still fewer monographs, chief among which is the notable contribution of the chairman of this conference (Commissioner Brown), there have been practically no American contributions. The ordinary histories which give a survey of the entire educational development or of the development of any particular type of institution, suffer on almost every page from that bane of uncritical work, namely, the acceptance of anything which appears on the printed page or in a written document as an established fact.

The same criticism cannot be passed upon the German work in this field. As is to be expected German scholarship has long cultivated this field. In a peculiar sense, the history of education, as an organized body of knowledge, is a product of

German research. From the time of the earlier students of the subject, in the middle of the 18th century, down to the present the interest and productivity has been continuous. The earlier works were of two types, either a history of educational institutions or of leading educators of particular countries, or the application of some system of philosophy to pedagogical doctrine, as in the case of Rosenkranz.

The later systematic works suffered in a way from a bias of the author—this cannot be eliminated. The first great systematic treatise, that of von Raumer in the early 40's—suffered throughout from the bias of an extreme classicist in dealing with realistic and all more democratic social movements. If the university presentation of the subject suffered from the bias of the classicists, the ordinary organization for purposes of instruction in the state supported schools for the training of teachers, suffered from the bias arising from an official religion and from a system of theology to be defended and inculcated. But the more recent work, such as Specht of a generation ago, or of Heubaum, or even Sherer of recent appearance, are beyond such reproaches. Such monographs as the series edited by Steinhausen (Monographien zur deutschen Kulturgeschichte), stand as a monument and as a model of combination, scholarly worth, and of popular presentation.

The opportunity and need for research work in the history of education, I will consider briefly in regard to the American field.

As to opportunity in our own educational history may it be noted, in the first place, that in the case of the American colonists we have the first instance of the founding of a civilization or culture or society, in which the founders kept a complete record of their motives and actions. These records are for the most part extant and include the materials for an educational history. These founders of the new society were self conscious to a high degree, examined their motives and were conscientious in recording their actions since they considered themselves to be a chosen people, with divine injunction resting upon them. Even in the case of the commercial colonies, the religious interest was so great as to demand some attention to the training of children in a formal manner.

Second: Note that these records are available. Not only the transactions of the general executive and legislative bodies are preserved in detail, but the local records are also fairly well preserved and are accessible. The New England town records are well preserved. In the case of 30 or more of these towns they are available in printed form. These contain most minute records of educational activities. In some of the larger towns the records of the school committee are also available.

In the case of New York the records of the Dutch West India Company were unfortunately destroyed, as late as the 19th century, but there are many other local records preserved. The parish records of Virginia and other southern colonies are many of them in existence. The examination of these for materials relating to educational activities is bound to throw new light on the life and ideals of these colonists and compel us to reverse our notion of their educational activities and interests. The records of the Society for the Propagation of the Gospel in Foreign Parts, which cared for the elementary education in all the royal colonies are extant practically complete.

The general records of the colonies are available and the educational material has been made fairly accessible. For the early 19th century there is a mass of material all unassorted, unanalyzed and undigested. There is no lack of opportunity.

A third point in regard to the opportunity is to be noted. The students of the early history of our country tell us that the most interesting of all points is to establish the actual transfer of institutions from Europe to this country; that this can be done very rarely. Here lies a very great opportunity for students of education, for it can be done regarding the school and educational practices. Despite the fact that the controversialists argue that there were no publicly supported schools in England, and no system of elementary schools as convincing proof that the colonists got their idea of schools from Holland or Scotland, it can be demonstrated that elementary education even in New England was a direct transfer from England. For the early schools laws in all our colonies were but modifications of the poor laws and the laws governing apprenticeship in England, and the early schools were fit instruments for carrying these out.

A fourth point to be noted in connection with the opportunity, is that the educational activity is about the only phase of the life of our people, especially in the colonial period, that has not been critically examined.

Colonial politics, colonial government, colonial religion, colonial customs, colonial dress, colonial literature, colonial industries, colonial theology, colonial philosophy have all been investigated, but colonial educational institutions, practices, ideals, methods, customs, have hardly been touched so far as the first hand information is concerned. And yet no phase of life is more thoroughly controlled by tradition than is education, and hence more worthy of study. The 19th century received its educational inheritance direct; and few fields of research are more fertile, and promise a more practical and serviceable harvest than that in education. The district system, the free

school, the academy, the non-sectarian college, the state university, all took their origin from conditions in the 18th century. They are the essentials of our educational system to-day.

The Need. The opportunity is great: the need is no less. So many reasons for such study suggest themselves that it is possible in the brief time at our disposal to suggest only a few type arguments.

And, first, one phase in the general need: such a study would assist in removing a great number of errors in our accepted educational traditions. Such for example as the conclusion that there were no schools and no interest in education in Virginia drawn from Gov. Berkeley's oft quoted report to the English government to the effect that he "thanked God that there were no free schools or printing presses and hoped that there would not be for a century." The most significant portion of the testy old governor's report is the sentence preceding, which is always omitted, namely, regarding education there prevails "the same course that is taken in England out of towns: every man according to his ability instructing his children."

Or more interesting yet, as indicating how a historical myth can grow up, take the case of the first New York school, long proclaimed as the first school in America. This myth all grew out of an inference which O'Callaghan, the first official historian of New York, made in his compilation of the early lists of settlers. From the examination of various legal and other historical documents, Mr. O'Callaghan drew up a list of the officers and servants of the company, among which was found that of Adam Rolandson, the first schoolmaster. Or to be exact, O'Callaghan's statement is, after giving the list of officers in the service of the company: "At Fort Amsterdam, at which place the Rev. Everardus Bogardus officiated as minister of the gospel." . . . "Adam Rolandson, 'schoolmaster,' arrived about the same time." Broadhead followed O'Callaghan with his history of New York and referring to the year 1638 makes the statement that "Rev. Bogardus continued to officiate as clergyman at Fort Amsterdam where Adam Rolandson was schoolmaster." Mr. Dunshee writing on the history of the Dutch Reform School in New York shortly after this puts the inferences of O'Callaghan and the statement of Broadhead together, interpolates a few words of his own, and makes Rolandson, who evidently was present in New Amsterdam in 1633 and who in 1638 does sign himself schoolmaster, as schoolmaster from the first. So that the history of the case then reads as follows: "In an extended list of the officers and servants of the Dutch West India Company

in 1638 Rev. Everardus Bogardus is again mentioned as minister at Fort Amsterdam where Adam Rolandson was still the schoolmaster." (Since 1633.) This statement has been repeated by all subsequent histories of education. As a matter of fact, the only evidence upon this educational history was all based upon a single affidavit made by Rolandson in 1638, to the effect that in 1633, while standing at the landing place in New Amsterdam, he witnessed some scandalous conduct on the part of one of the settlers. This affidavit was made to impeach the character of the witness testifying slanderously as to the character of the pastor. In the ecclesiastical records published in 1901, some further documents bearing upon this matter are brought to light, one to the effect that the same Rolandson applied for a license to teach and was examined by the Classis at Amsterdam according to the statute passed in 1636. This license was granted on the 4th of August, 1637, with the statement that he had requested the license in order to go to New Netherlands as schoolmaster and was accepted, the record closing with the statement "and he was sent thither." There he is again found in 1638, where he probably could not have arrived before the fall of that year, as we know from the records of the ship's arriving. So that the whole story of the much heralded first school in America falls to pieces after a little examination of the record and the long debate as to the priority of educational institutions in this country, upon which has been built a great structure of educational history, is found to have been erected on a single document of a scurrilous character, having absolutely no reference to education and resulting in the wholly erroneous use of a harmless inference of an early historical investigator. Our history of education is full of such unsubstantiated inferences.

Second, we should note the need to the teaching profession itself. Here the value of historical study is the guidance it will give in testing the great variety of ideas and methods brought forth each year by educational experimenters or novices. For the most part these so-called *new* methods or ideas are not new; most of them have been suggested time and time again; most of them have been tried, most of them have failed, or proven but partially successful. To this class belong the great number of so-called "fads and frills." No profession is so dependent upon tradition as is that of the teacher. In attempting to throw off the thraldom of tradition the innovator is apt to go to the other extreme and develop a fad or append a frill. Now an educational fad is simply a worthy educational idea or practice out of focus,—exaggerated. An educated frill is a desirable supplement to existing educational endeavor but not organically related. Historical research will reveal

such endeavor as made in the past, and by presenting all the conditions of the experiment, will enable it to be judged on its merits and in its relations. All of our educational mistakes have been repeated over and over. Most of the worthy modifications have been attempted time and time again before they are properly accepted and incorporated into the dominant body of practices. Historical study will develop a saner judgment to pass upon all individual suggestion claiming the merit of novelty; a keener insight to consider an experiment or an accepted practice in all its relationships; an open-mindedness toward suggestion of improvement and a keener desire to bring that which is to what it might be.

Third there are the needs which suggest themselves when education is considered from the standpoint of university studies or disciplines. By the use of historical and of experimental scientific methods we can bring our work into harmony with other university studies. When the professional student of education can demonstrate that he uses the same scientific methods, has ideals and aims of pure scholarship as well as those of practical accomplishment, works upon similar materials, the prejudices which arise in academic circles towards any new and partially formulated subject will disappear, so far as his own subject is concerned. Each new field of human interest as it has passed through the field of partial organization has met this criticism and opposition of the devotees of better organized intellectual interests. The natural sciences themselves had a longer and more bitter struggle than any other; hence it is to be expected that they would repeat the opposition to the newer social science, which from the very nature of the phenomena dealt with can never possess the same definite organization. But the scientific study of education has won a place in all higher institutions of learning, has won the respect of the modern university man, because of its practical necessity and real influence; perhaps, as yet, it is too much to ask for intellectual sympathy from the devotees of these disciplines where the "pure" is yet sharply distinguished from the "applied."

Finally there is the need of the student. There are some decided advantages to be derived from the use of the exact scientific methods of study of educational phenomena which do not inhere in the use of the comparative historical method. On the other hand this latter method possesses distinctive merits of its own; and these merits commend it especially to the student of education. The experimental method depends for its success always upon the elimination of many factors which actually exist in the problem; to such an extent is this true that the problem worked with and solved is usually a highly

artificial one, isolated from real life by successive elimination of factors which do not enter into the particular problem attacked, but do enter into life wherever the problem occurs. Now the historical problem is always the solution of organic relationships by means of comparative methods. The student must always deal with the problem as it actually occurs in life, and reaches his conclusions by comparisons with similar problems of actual life or of the same problem under somewhat different social conditions. In other words such study tends not only to produce those results which inhere in all scientific training, but also to develop those very qualities that are most used by the successful teacher.

He develops not only keen insight and good judgment but also the intellectual sympathy which produces that breadth of interest, that "many sided interest;" which is the test of the well developed personality of the adult as well as the ideal and objective of schoolroom instruction.

UNDERGRADUATE INSTRUCTION IN PEDAGOGY

By Thomas M. Balliet, Ph. D., Dean of the School of Pedagogy, New York University

Should undergraduate instruction in pedagogy in our colleges differ from graduate instruction in our universities? If so, in what respects? Should it have the same aim and be only of a more elementary character? Should it aim to lay the foundation for future graduate study? Or should it aim to prepare the student to go out after graduation from college and teach school?

These are questions, it seems to me, which have not received the attention which the present situation in our colleges demands.

In the case of students of law and of medicine, and to some extent also those of engineering, certain studies pursued in their undergraduate course and bearing directly on their profession are credited both towards their Bachelor's degree and later towards their professional degree. In some universities the first part of the professional course is allowed to be substituted for the last part of the undergraduate course and is credited towards both degrees. It is clear that in these cases, undergraduate studies of a professional character should be such as are fundamental to later professional study, and that the aim of the instruction should be to prepare the student for such study. The student of law does not begin the practice of the law, and the student of medicine the practice of medicine, immediately upon graduation from college; but he begins at once his professional studies and does not enter upon the practice of his profession until his entire professional course is completed.

The case of the student of pedagogy, however, is different. Immediately upon graduation from college he enters upon his work as a teacher; only in rare cases does he go from the college to the university and pursue a course in education there before beginning to teach. This fact has a vital bearing on the question as to what the character of his undergraduate course in pedagogy should be. The time will, no doubt, come when a college graduate who is to be a teacher will be required to devote several years to professional study in a university before entering upon his profession, but that time is apparently in the distant future; and until then provision must be made in our colleges to give that "first aid" which will enable the fresh

graduate to teach and manage a school with at least moderate success until he can learn by experience what he ought to have learned in a professional school before he began to teach.

Professorships of pedagogy in colleges, I believe, are temporary means to help out a desperate situation. Under present conditions they seem to be the only means by which many teachers for our secondary schools can get any professional training whatever. Ultimately we shall recognize the fact that as law schools are necessary to train lawyers, medical schools to train physicians, so there is need of professional schools in our universities on a graduate basis, for the training of teachers for secondary schools and the supervisory positions in the elementary schools.

But to meet the immediate needs much can be done in an undergraduate course, and much is now being done in some colleges, even by a single professor, that will be of great practical value to the young graduate who cannot afford to go through a professional school. Obviously in such a course no attempt should be made to cover the entire field as would be done in a university school.

The question, then, as to what part of the field should be covered, where the emphasis should be placed, and in what respects such a course should differ from a graduate course becomes a vital one. It seems to me that we are not now making a sufficient distinction between the two. Undergraduate courses in many colleges seem to differ from graduate courses in quantity rather than in aim and character; and much of the instruction, while it may have a high academic or culture value, does not directly train the student to do the work of the school. As most college graduates who enter upon the profession of teaching do so immediately upon graduation from college, the aim of the pedagogical training in college should be very practical. Such training should be of a character to give them all the help possible to teach and to manage a school. Not to speak of the interests of their pupils, which are paramount, their own reappointment and their future career depend largely upon the quality of their first year's work. Unless the undergraduate instruction in pedagogy enables young graduates to teach and manage a school better than they could have taught and managed it without it, school authorities will not make much account of such training in the selection of their teachers. When you cannot detect a trace of such instruction in the schoolroom work of young graduates — as I have personally known it to be the case in not a few instances—school authorities will not take the training very seriously.

An undergraduate course in pedagogy should have a twofold aim. First, it ought to bring before the student the leading

problems of education and impress on him their bigness and their difficulty. The young graduate is apt to appreciate only the academic side of the teacher's equipment, and to imagine, as some older persons in college faculties still do, that teaching is mainly a knack and does not involve any very profound or perplexing problems. It is possible to introduce a student to the study of pedagogy by a clear presentation of the problems of pedagogy just as it is possible to introduce him to the study of philosophy by a preliminary statement and brief discussion of the problems of philosophy. It matters little whether such a course be called "Philosophy of Education," "Principles of Education" or "Introduction to Pedagogy," only so the aim be what it should be. Certain problems of education can be best formulated in connection with the history of education, but as these are problems of social or state education and the young teacher has at first to deal mainly with those of individual education, these latter should receive the emphasis.

In the second place, such a course should aim to give him the practical training which will actually enable him to teach school. This involves instruction in methods of teaching and in methods of managing a school. It is not the larger problems of school administration which he needs to study—the organization of a school system, types of schools, the appointment of teachers, the financing of a school system, and others like them. With these even the most ambitious young graduate can hope to have but little to do for some years to come. It is rather the problems of class discipline, class management, methods of promotion, and the management of the apparently petty details which so largely determine the successful running of a school, which he needs to understand. If there is time for a brief discussion of the larger questions so much the better, but they must not crowd out the others.

The instruction in method should cover the subjects which he is likely to teach. I have found that many young graduates are almost protoplasmic in their lack of differentiation and are willing to undertake to teach almost any subject in the curriculum of the secondary school. This condition of mind suggests that an undergraduate should be made familiar with the principles underlying method as determined by subject matter and the laws of mind, and with the best methods of presenting quite a large group of related studies in the curriculum of secondary schools. These methods should be discussed in detail, even to the suggesting of happy devices. Anything short of this will not answer his needs. To assume that if a young teacher is taught the principles of method he can and ought to make his own applications, is to take an untenable position. Often, after a teacher understands the principle involved, the

suggesting of happy devices is the most helpful thing that can be done for him. We do not train surgeons by teaching them merely the "principles" of surgery and then letting them apply them themselves, but we teach them the details of operations. Even after such training they will sometimes travel a thousand miles to witness an operation performed by a great surgeon. The best training for the lawyer and the engineer cannot afford to leave out the practical side. The training of teachers is no exception. It must not be predominantly theoretical in an undergraduate course, where there is in the main time only for the practical.

It is a weakness of the small village high school that there are too few teachers to make much specialization possible. A teacher is obliged to teach too many subjects to teach any of them well. On the other hand, it is a weakness of the larger city high school that there is too much specialization. It makes the teacher narrow in his outlook, he fails to see the close interrelations of subjects, he is more interested in his "specialty" than in his pupils, and usually has little interest in the broader educational problems of secondary education. A high degree of specialization is absolutely necessary in a university where research must constitute a large part of the work; but in a secondary school, where at best only the elements of any subject can be mastered by pupils, such specialization is fatal to good teaching and to the growth of the teacher. Because of the elementary character of the work, the teacher in a secondary school must find his chief interest in his pupils, who present to him ever new and fresh problems, and not in his subject. Every such teacher should, therefore, be prepared to teach an entire group of related subjects. Every teacher of Greek should also be able to teach not only Greek history, but also Latin and Roman history, every teacher of any of the natural sciences should be able to teach any other or all of the natural sciences in the course.

At all events, he should be able to teach either physics and chemistry or any other two of the sciences, and not confine himself to one science. Every teacher of mathematics should be able to teach every branch of mathematics taught in the school and physics besides.

Accordingly every student should be well trained in the method of teaching at least one group of related secondary school studies.

I am aware that there is a prejudice in many college faculties against pedagogy as such and particularly against instruction in method. Such instruction is characterized as not "cultural," not "scholarly," and is thought to be out of keeping with the dignity of collegiate instruction. This is a prejudice

which has been partly justified by the superficial literature on pedagogy, especially that on method, which we have produced in this country, but which is being rapidly displaced by a literature of a more scholarly kind. It is a prejudice which must be patiently dealt with and which will in due time surely die out.

It seems to me one of the most pressing problems in pedagogy to-day is that of method. We have had so much superficial literature on it that it is difficult to interest the theoretical student in it. It is the subject in which teachers of pedagogy in colleges and universities are weakest to-day. Of what practical value is all our study of educational psychology, of the history of education, of the philosophy of education, our child study, our experimental pedagogy, if it does not finally result in the devising of better methods of teaching and make the teacher more skillful and effective in his work?

The question as to who shall give this instruction in method is one to which various answers are possible. It is obvious that no one person can give it. The professor of pedagogy may be familiar with the details of method in several groups of secondary school studies, but he cannot compass the entire curriculum. In a few colleges it has been found feasible to have this instruction given by other members of the faculty, each professor teaching the method of his own specialty. In many colleges—perhaps in most of them—this is not practicable to-day, because most of the professors know little of secondary school problems and conditions and of the modifications of college methods which these make necessary. As a rule, college methods of teaching, even if they are good for college instruction—which they not always are—are very generally bad when employed in the secondary school. Probably the most satisfactory solution of the problem under present conditions is to have part of the instruction in method given by the professor of pedagogy and the rest by successful teachers in neighboring high schools.

By way of supplementing this training in method, provision should be made, as is now quite generally done, for the visiting of nearby schools in which the student can witness the working out of what he is theoretically taught. Where possible this should be followed by a limited amount of practice teaching. All this is now generally recognized. But what is not yet recognized is that, without specific instruction in method to interpret to the student what he sees, the visiting of schools is of little consequence; and that, without previous instruction in method and without careful direction and critical supervision, practice teaching is of little value.

To what extent should the history of education be taught to

undergraduates? The history of education is a part of the history of civilization and is a subject which ought to occupy a large place in a graduate school of education; but it is not a branch of pedagogy which directly helps the young teacher to do skillful teaching or to govern his school, and should therefore occupy quite a subordinate place in an undergraduate course. Furthermore, it is a subject the thorough treatment of which requires a degree of preparation which few undergraduates, if any, have. It involves a knowledge of the history of philosophy, of social and industrial as well as political history, of church history, and of the history of art and of literature. Without such preparation much of the subject remains unintelligible to the student. It is a branch of pedagogy which should in the main be reserved for graduate work.

All that should be attempted in this subject in an undergraduate course, should be: First, to show the student how society in all ages has used the school to solve certain of its problems and to perpetuate civilization and culture; and to impress on him the function of the school in the social heredity of the race. Secondly, to trace the origin and growth of the ideals of education which are dominant in the educational thought of to-day. For the former purpose, a comparatively few well-planned lectures will answer; for the latter the material indicated by a book like Quick's Educational Reformers will be ample. It has been said that such a course in the history of education would seem superficial to the student and would not command his respect. I think it can be said, without unfairness, that where this is the result, it is not the fault of the course.

The question of the psychology that should be required—both in quantity and kind—is often not easy to solve. Unfortunately the psychology taught in our colleges to undergraduates is very largely experimental psychology and is not the sort of psychology which appeals to them; nor is it the psychology which is of much value to the prospective teacher. All professors of pedagogy recognize this fact, and they usually lug into the course, somewhat surreptitiously, as much of the psychology which is helpful to the teacher as they can, under what they denominate "Principles of Education" or "Philosophy of Education." So long as it is not called "Psychology" the department or professor of psychology does not object. Such subjects as memory, imagination, types of mental reproduction, habit, instinct, the feelings, characteristics of adolescence, fatigue, are subjects which ought to be discussed with undergraduates, but with special emphasis on their application to teaching and to life. A number of simple experimental studies in experimental pedagogy can profitably be made for

which no intricate apparatus is necessary, if only to check the tendency to form hasty conclusions.

Much of this instruction can be effectively given in connection with the instruction in methods as the immediate reason for the method. Much of the instruction in principles of education can be given in the same way. To summarize briefly, I would say that we ought to discriminate more than we do between the aim and character of undergraduate and of graduate instruction in pedagogy. The aim of the undergraduate instruction should be much more practical than it now is. It ought to treat every subject with direct reference to its practical bearing, and aim to do all it can to make the student as efficient a teacher as possible the very day he enters the schoolroom. College training in pedagogy will not permanently retain the respect of school superintendents and principals unless this is accomplished. Up to the present, the value of such training has been largely accepted on faith.

On the contrary, in the graduate school of pedagogy of the university, organized like any other of its professional schools, with a Faculty each of whom can devote himself to one department of pedagogy, and with a student body that is mature and most of whom have had some experience in teaching, the aim should be different. Here the history of education should occupy a large place; the philosophy of education should deal in a scholarly way with the great educational problems and with the conditions and methods of their solution; experimental psychology should have its place, and experimental pedagogy should be assigned a large place—much larger than it now has; the great problems of administering our city and state school systems should be discussed, and the details of schoolroom work may now well be assigned a subordinate place or omitted; the instruction in method should dwell not on devices but on the psychological basis of method and on the necessary modifications of current methods, familiar to the student, in the light of the results of psychology and of experimental pedagogy.

Along with all these courses, more strictly pedagogical, the student should be required to take at least ethics, sociology and the history of philosophy.

Finally, a school of education of this kind should make ample provision for research. The teaching profession has a right to look to these university schools of pedagogy for new light on educational questions. Teachers in elementary and secondary schools are too much burdened with their daily work and have not the necessary facilities to carry on investigations as the professors of pedagogy in universities have. They can rightfully demand of the university that it aid them in solving their perplexing problems.

THE DEPARTMENT OF EDUCATION IN COLLEGES FOR WOMEN

By Anna J. McKeag, Ph. D., Wellesley College

A department of education should, to a certain extent, be adapted to its academic environment. In the colleges for women the conditions are different from those found in the state universities and the teachers' colleges; distinctly cultural aims receive greater emphasis. Moreover, only about one-third to one-half of our students expect to enter upon definite salaried occupations or professions.

Because of these and other conditions, it would be inexpedient, even if it were desirable, for those of us who teach education in colleges for women to attempt a differentiation of undergraduate introductory courses on the basis of the vocational or non-vocational aims of our students. I believe that such a differentiation (in the first year's work in the department) would be undesirable, even if it were expedient. The prospective teacher, the prospective home-maker, the prospective social worker, may profit equally from the same first course in education, just as the future journalist, physician, and engineer, from the same freshman course in English. Differentiation properly comes later, in advanced courses.

That the two courses most commonly given as the first courses in the department of education (History of Education and Principles of Education) should be given in the same manner and in the same classes to professional and non-professional students (in colleges for women), is a point that needs to be emphasized. Much of the discredit that has attached to our departments of pedagogy has been due to the fact that we have addressed ourselves too exclusively to teachers. Education is a public institution and as such is worthy of study by all college students. Let us catch in the net of our introductory courses as many non-professional students as possible, for of such is the future school committee.

A good deal of diversity of opinion still exists among us as to the *aims* of the first two courses in education. I believe that, in the first place, the informational aspect of the subject should receive due emphasis. Information-courses are, it is true, at a discount in collegiate circles just now, but surely a reasonable amount of extensive work is necessary in order

that the student may get any kind of orientation for his future intensive courses. A clear, orderly, and systematic presentation of the great educational systems and theories is desirable for first-year students in the department of education.

Closely allied to this informational aim of our introductory courses is a second and equally fundamental one. Courses in education should exemplify a good method. Such method will vary with the course, it will vary with the equipment of the instructor, it will vary with the previous academic history of the class, but it is important that we should give in our departments really good teaching. I should not wish to be understood as undervaluing the subsequent presentation of the subject of general method or of special methods in a separate course; I am speaking now merely of the first year's work in the department.

A third of these more general aims of introductory courses may be characterized as inspirational. One of the great utilities of the study of the History of Education is that, through this subject, prospective teachers gain a feeling of professional pride, an *esprit de corps*, akin to that which is recognized as a powerful stimulus to good work in other professions. In these days of research work and critical scholarship, we college teachers are prone to relegate enthusiasms and ideals to the lumberheaps of our academic attics, forgetting the very great importance, to most young people, of just such subjective factors.

To what extent should the first year's course in education be professional, in the sense in which the term professional is commonly used? As institutions of higher learning, colleges very properly demand that courses in the department of education shall not be inferior to courses in other departments, judged from the standpoint of scholarship. The superintendents and principals of schools rightly ask that our students shall "make good" in the schoolroom. Both of these demands are reasonable. There should be, and I believe there is, no antagonism between knowledge and efficiency. The introductory course in the History of Education, for instance, may have both cultural and practical value, if presented from such a standpoint as that which was described by Dr. Suzallo in a recent paper: "A selective, interpretative, and fully unified treatment of educational experience in its various aspects and relations, used as an aid in the formulation of a theory for the control of the present practice which is to be viewed as the latest stage in our educational evolution."[1]

Introductory courses in the principles and the history of

[1] Proc. Soc. College Teachers of Educ., 1908, p. 54.

education should, it goes without saying, have constant reference to actual schoolroom conditions. The study of children and observation of schoolroom methods and practices should form an important part of the student's work. So far as my knowledge extends, departments of education in colleges for women have been most cordially given by superintendents and principals ample facilities for studying school work under natural conditions.

Among the problems most difficult of solution in college departments of education is that of the place which should be assigned to practice teaching. It may be seriously questioned whether students get any permanent good from what may be called "sporadic" practice teaching; and the exigencies of undergraduate schedules seem to preclude the possibility of anything else. The ideal solution of the problem seems to consist in the addition of a year of graduate professional work, of which the regular systematic teaching of a class for a semester shall constitute a part.

Most of our professional students desire to go into secondary school teaching on leaving college. While it is desirable that the fundamental importance of elementary school work should be brought to their attention, and while it is to be hoped that eventually many of our best graduates will be drawn into the elementary schools, it must be remembered that the body of college graduates is still a comparatively small one, that secondary schools need pedagogically trained teachers, and that the field of elementary education is already largely occupied by the normal schools. Hence, largely as a matter of expediency, and without any thought of assigning any superior importance to one set of schools over the other, it may be better that colleges for women should make a special effort to send out properly equipped teachers for secondary schools,—for a few years, at least.

I should like to outline a course in secondary education, which might profitably occupy the greater part of a year of graduate professional work in colleges for women.[1]

1. A study of the development of secondary education, with special reference to the development of the American High School.

2. A study of the fundamental principles underlying the education of adolescents. Physiological and psychological considerations should receive due emphasis, and there should be a careful study of the hygiene of instruction.

3. A study of the organization and curriculum of two typical high schools; one a city high school, the other a village school.

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[1] This course is being given at Wellesley College (1909-10).

4. Each member of the class should make a study of the special methods of teaching one high school subject or group of subjects. This will include: (1). A study of recent educational reports and the best books relating to the teaching of this subject or group of subjects. (2). Observation of the work of skilled high school teachers of the subject. (3). Instruction in good methods of arranging and ordering the material in the subject. This part of the course should be given by an instructor qualified both by scholarship and by secondary school experience to give such instruction.

5. Practice teaching. Each member of the class should be required to teach a class for a semester in her chosen subject. This should be done under the joint supervision of the department of education and the principal of the high school.

These seem to me to be among the legitimate aims of departments of education. It goes without saying that we should make it perfectly clear to our students that we hold out absolutely no hope to the mediocre, the indolent, the careless, or to those of unsuitable personality, that by our courses they may, in some alchemic manner, be changed into good teachers. There are other limitations that we must admit: we are, as it were, but middlemen between the producer and the consumer; between the pure psychologist and biologist on the one hand, and the schools on the other. Yet our field is none the less useful and none the less definite.

To summarize:

The work of at least the first year in departments of education should be given to professional and non-professional students in the same classes.

Work in observation of children and of schools should form a part of the introductory courses in education.

Informational, cultural, and inspirational aims should not be neglected.

More narrowly technical courses can be given to best advantage to graduate students. College graduates should be encouraged to give a year to systematic and professional preparation for high school teaching.

Our departments should include a sufficiently large teaching staff to make possible to instructors a personal knowledge of the capacities and aims of their students.

EDUCATION AS A COLLEGE SUBJECT

By Edward Franklin Buchner, Ph. D., Johns Hopkins University

Two things stand out in a very interesting way when one comes to view the situation surrounding education as a college subject. To such as "believe in" education, the recent widespread introduction of the subject into the curriculum of the colleges and the universities is most gratifying. The records of this movement, which have been made, for example, in the reports of the Commissioner of Education of the United States, by Bolton, Farrand, Kinnaman, Luckey, and others, show that the subject has acquired a most hopeful, and in many respects remarkable, intellectual interest. The range of historic and present day facts and the seriousness of the scientific foundations of theory alike show the inordinate gains which have been made so rapidly. On the other hand, the resistance in higher educational circles against "pedagogy" has not entirely ceased. The older conception, which interpreted the teacher exhaustively in terms of scholarship, lingers in many places outside as well as inside academic walls. It cannot be denied that this resistance has been and is good for both the scientific and the academic integrity of our subject. It must, as it should, win its way into a confidence that demands, and is entitled to full justification.

It is particularly encouraging to note the striking advances which education as a specific topic has made. Restricting the view to a few American events, one becomes impressed with the unusual broadening which has come to it in a few decades. Seventy years ago (1839) our first normal school had its beginnings here in Massachusetts. *Forty* years later (1879) we find in Michigan the first university chair of education, marked by reason of its helpful continuity with more recent developments. Nearly *twenty* years more pass (1898), and we discover in Teachers' College a university school or department of education in its affiliations with Columbia University. A full *decade* more brings us well within the thought of these days of celebration when we signalize the twenty years of achievement at this institution. Whether the same rate of gain shall continue to hold in the future is a fair hope that must be left, not to the prophet of to-day, but to the historian of *five* years hence. No one of these movements has supplanted any

of the others; instead, each has been a special stimulus to those which followed. The rapid acceleration of speed in the widening sphere of content and method in education has been nowhere more emphatically recorded than in the contributions and aspirations which have flowed forth from these walls during the two decades over whose termination we make festival at this time. There is ample reason for sincere congratulation upon the newer character that has become the possession of education in these days. The closer definition of problems has opened the way for more careful and exact scrutiny of methods of inquiry until we have long since passed the hour when our subject has become the happy recipient of the best that is to be gained from the application of the technique of almost every mode of human investigation.

The rapid series of events which have won for our subject an increasingly favorable recognition in academic centres may also be regarded as significant in another direction. The peculiar emphasis placed upon education to-day cannot be viewed other than as one of the quickening processes by which democracy becomes conscious of itself. The American public has, from the early days, believed in the striking necessity of education as the most distinct social force. And, the practice of teaching and the experience in administering schools of almost all orders have proceeded with the conviction that this force is amenable to an increasingly direct and scientific control. It is true that education as an art, and not America, was "discovered" first; but it is also becoming more and more true that the inner logic of our typical social and political institutions is working its expression out into the insistent demands of our national life that clamor at the doors of our higher institutions of learning for satisfaction. For this reason, if for none other, the normal school could not remain typical of our profounder belief in the democratic efficacy of education as a practice. Our educational problem in its theoretical aspects has just as definitely outgrown the distinctive excellencies of the normal school as the latter has found itself incapable of modifying itself to meet the needs of the changing complexion of our more richly varied modern life. The normal school, therefore, properly continues to exercise its special and important function of training teachers for our elementary schools, while the institutions of higher education have found it more and more clearly to be their own duty to enrich the content of education by investigation and to disseminate this knowledge and its methods by training teachers for our higher and more special schools. It is such a train of inner events which accounts for the excellent external fortunes of education as a college and university subject.

It is not my wish at this time to reiterate the many words

that have been said during these recent decades in favor of education, nor to sketch the arguments which have been devised for the support of the growing belief in its academic integrity. Those who are interested in this celebration, whether absent or here assembled, are now pretty well agreed upon the intrinsic merits of education as well from the cultural as the professional point of view. It may, therefore, be more serviceable should I venture to suggest some less patent, but none the less weighty, considerations which tend to determine the good and ill fortunes of education as a college subject.

Speaking in the full light of the historical and scientific interpretations now in our possession, it must be said most emphatically that education as a college subject depends chiefly upon the particular college itself. And by the college, we must understand its traditions, its location and the relative density of population in which it is centered, its financial resources, its modes of appeal for students, its purposes so far as these are socialized and democratized, and finally the institutional interest it may have in the specific future welfare of its students. These items come close to an exhaustive description of any given college. No one of us need review at length institutions of his acquaintance without finding such as readily illustrate these dependencies. A college far removed from centres of population is not inclined to sense the duty of recognizing education as a future life interest of some or all of its students. On the other hand, the college situated in the midst of a populous area, or even a state university irrespective of its location but sensitive to the public's requirement of trained citizens—not to say teachers, is more than likely to be alive to the civic service that is immediately possible of realization through a well-balanced establishment of education as a subject of teaching and study. Again, a college loaded with more or less unwieldy traditions, and at the same time light in financial resources, is not apt to hasten the introduction of education. Its conservatism pledges it to a maintenance of the longer standardized subjects. On the other hand, it is not an unknown practice on the part of young institutions, 'unhampered' by traditions, students, or funds, to resort to the establishment of a "normal department" in the hope of securing students for the institution as a whole. It is, however, chiefly when a higher institution awakens to the necessity as well as the possibility of performing a distinct social service that the welfare of education is most likely to be promoted. There remains to-day scarcely a college or a university that is not increasingly recognizing its public and social obligations, and is not endeavoring to modify its ideals and equipment accordingly. The old days of collegiate isolation and academic in-

difference are practically gone. Into this newer situation education is working its way more and more acceptably. But, into a detailed elaboration of the bearings of these factors, either with reference to the attitude of the college towards education as a proposed subject, or with reference to the fortunes of education after it has become an accredited interest in the college, the limitations of this conference hour do not permit us to go.

The other group of contingencies of which I wish to remind you may be stated very summarily. When education as a subject finally gets into the college, what it becomes,—or, what becomes of it, —depends upon the man who put, or who keeps, it there. And this is almost identical with saying that it depends upon what education is, or is thought to be. If the traditions of former generations and the experiences of past attempts at schooling are conceived to be the best avenues for securing training for to-day, then the history and the classical literature of education become over-emphasized. If the generalizations of individual development and training are the chief goal, then the theory or principles of education determine the prevailing interests.

If the manipulations of the agencies most effective in handling masses of children in the light of natural limitations and of the current demands of democracy are the goal, then education tends to be restricted to school administration. And so on to the end of the chief topics that constitute education as a subject of teaching and study. But, happily, we have well passed through the stages when history, theory, methods, hygiene, and economy were each given a radical emphasis, and the collegiate standing of our subject has become an encouragement for each of these formative educational problems. Furthermore, there is definite progress made in our approaching standard evalution of these factors, irrespective of the future prospects of the college student who is to become a citizen trained in thinking over the problems inherent in the community interest in a system of schools, or who may become a teacher trained in the demands of a more and more intelligent and responsible citizenship.

It is not too much to say, finally, that the college should consider the intrinsic merits of education, both as a 'subject' and as a part of life,—its real value in relation to academic culture, before reaching the decision whether the study of it should be included in its own curriculum. While the study of education should, on the one hand, tend to "professionalize" the future teacher, it does, on the other, definitely "liberalize" the college student. Here, indeed, must be sought the last claim favorable to education as a college subject.

THE HEALTH OF TEACHERS

By W. S. Small, Ph. D., Washington, D. C.

I ask your attention, for a few minutes, to the consideration of the health of teachers as illustrating the general thesis of this conference, "The Need of Investigation in the Field of School Hygiene;" and, more especially, the motives, by appeal to which, investigation may be made effective, both in itself and in practical results.

From a practical standpoint needs are purely relative. From a scientific standpoint, investigations in the field of school hygiene are needed to fill gaps in knowledge. It is enough that here is ignorance. Curiosity is sufficient motive. The desire for knowledge constitutes the need. To the lay mind, however, this is foolishness—and in large measure the community mind is *lay* with respect to the hygienic aspects of education. It is an exceedingly vital matter, therefore, to find needs which appeal to the lay mind, motives for investigation and application of hygienic principles that will seem worth while to those whose interests are practical rather than theoretical.

From this standpoint, therefore, I wish to present some brief observations upon motives for the investigation of the health of teachers. Scientific curiosity at once says: "We ought to know about this matter; we ought to know whether the health of teachers compares favorably with that of the members of other professions; we ought to know what diseases teachers are specially liable to; what conditions in school life are especially unfavorable; what sex differences there are; what differences there are between teachers of different grades (elementary, secondary, higher)." Practical interest asks, however: "To what end? What will be done, who will be benefited, if such questions as these are answered?" It must be shown that the answers to such questions have immediate and practical significance if we would win the co-operation of the practical minded. For my present purpose, practical motives may be generalized into three classes: self-protective, humanitarian, and economic.

Teachers should be motivated by self-protective interests. Teachers, after all, are human beings with about the same constitutions as other human beings. Doubtless it is true that altruistic motives, closely allied to the parental instinct, are

powerfully operative in the real teacher. The aim and rewards of teaching are the welfare of others. To spend and be spent is the normal business of teaching. But joyous expenditure of energy in service is possible only to him who hath energy. If every teacher were thus actuated by ideal motives, were serving in the "noblest of professions" purely in the interest of humanity, and not at all as the most convenient means of a livelihood, health as a means to that end would still be a solemn duty—the duty of being as efficient as possible in the chosen service.

That their own welfare and happiness are at stake is sufficient reason why teachers should have an active interest in the investigation of the hygiene of their own occupation. It doubtless ought to be sufficient reason why others, especially parents, should be similarly interested; and *doubtless it is not.* Something more personal and intimate is required to stir the interest in any community except of the slender few who are humanitarians by nature. Sweat-shop evils draw but a languid protest from most people until they appreciate that sweat-shops are a menace to the community health, and, therefore, to themselves, as individuals or as families. Sometimes, even, the concrete demonstration of an epidemic is required.

To win the general attention from parents to the importance of protecting the health of teachers—which of course is the end of investigation—it must be shown that teachers of subnormal health are a menace to children; or, at least, that the value of the school to the children varies directly with the health and vitality of the teacher. This will hardly be questioned by competent school and medical men; but about the best that can be done at present, in presenting the matter to the public, is merely authoritative general statement. We know in a general way, by common experience, that teachers are liable to nervous disorders and that this common experience is confirmed by such few careful investigations as have been made. As to the real extent and degree of this factor we are in the dark. Mr. W. H. Allen declares that it has come to be "a matter of course that teachers are nervous wrecks" and "this fact is offered by teachers themselves as sufficient explanation for impatience, irritability, and downright ugliness of disposition." If Mr. Allen's assertion be even half true the moral damage to children from this source is incalculable. Not to mention nervous injury and intellectual loss, the moral damage furnishes the strongest kind of motive for investigation of the health of teachers, a motive that will be effective in enlisting the interest of all intelligent parents. The fact that a certain percentage of all the teachers in the community are suffering from nervous strain, so that their personal happiness and joy in life are im-

paired, may elicit commiseration and some deprecatory protestations that something ought to be done; but the fact that this does not stop with the sufferers, but is transformed into positive damage to the children in our several homes is quite another matter. We as parents want to know whether the teachers of *our* children are thus suffering and we are even interested in knowing both the extent and the nature of the ills to which the conditions of school life render the teachers especially liable.

Finally there is the economic, the tax-payer motive. As humanitarians or as parents, we of the community may be appealed to on account of the injury teachers, as a class, suffer from the unhygienic conditions of school life or the injury that our children receive through the agency of teachers who have thus suffered; but there is still the tax-payer part of us, individually and collectively, that is not moved by these considerations. We must be shown the wastefulness of ill-health in the teacher. The American Health League is presenting some very impressive figures as to the economic waste of ill-health. The loss from premature death, reduction of labor on account of preventable sickness, the cost of sickness in the form of the expense of doctors and nurses, and reduced efficiency due to impaired vitality—these losses amount annually to a total of billions of dollars. We have here a powerful motive for investigation and improving conditions of life. It becomes a matter of real consequence to the tax-payer whether the hygienic conditions of teaching are such as to guarantee the best services of which the teacher is capable.

AN EXPERIMENT IN LEARNING A FOREIGN LANGUAGE

By WALTER LIBBY, PH. D., Northwestern University

During recent years the question of how foreign languages may best be taught has been more than once submitted to investigation of a more or less strictly scientific sort. One might mention in this connection Conradi's study of 1905, in which he showed how poor may be the Latin vocabulary of pupils who have been taught Latin one or more years by the usual defective methods. Then, in 1906, Schuyten published his investigation in reference to the learning of foreign words —German, French, and English—in which it was shown that the ability to recall the vernacular word on the presentation of the foreign word is frequently two and three times greater than the ability to recall the foreign word on the presentation of the vernacular. In this same year W. A. Lay, in his periodical on experimental pedagogy, attacked the problem of direct and indirect language instruction by his method of experiment, research and statistics. In 1908, Prof. O. Steinel published his work on grammar instruction on a physiological basis; while, at the beginning of that year, Prof. E. J. Swift put on record an experiment in the teaching of Spanish carried on under his direction by Mr. William W. Hall, of St. Louis.

No one who stops to think of the amount of time and money consumed in the teaching and learning of foreign languages in our secondary schools, and our so-called institutions of higher learning (in which a large part of the curriculum is given up to the teaching of elementary foreign language), can doubt the importance of the matter with which these investigations concern themselves. It was with the hope of contributing something to problems arising in language instruction that the experiment here recorded was undertaken.

The special purpose of the study was to discover the relative value of making the word or the short sentence the unit in modern language instruction for different types of learners. Naturally other matters, worthy of the consideration of all language instructors, were brought to attention. In the conduct of the experiment we aimed at preserving as far as possible the classroom conditions usual in high school and college, with the important deviation that each exercise lasted only twenty minutes.

The procedure was to place before the members of a class of ten in experimental pedagogy an exercise in Italian consisting of ten short sentences of approximately five words each and ten detached words, *i. e.*, about sixty words in all. None of the class had previously studied Italian, though, as we shall see in detail later, all had studied some foreign language. On the first two occasions the exercises were written on the blackboard; for all the other tests the exercises were typewritten and put before each student. During twenty minutes the Italian was translated, read aloud, written out by the members of the class, and otherwise learned and taught. Eight exercises were given in all. On the fifth occasion a nine-line quotation was substituted for the short sentences; the passage was a very impressive one from the Inferno. Again, at the seventh exercise, it was thought well to vary the monotony by substituting for the sentences eleven lines from an opera. This song and examples of the sentences and words will be given later. An interval of one week elapsed from the beginning of one exercise till the beginning of another, except that there was an interval of two weeks between the sixth exercise and the seventh. A certain procedure was adhered to so far as rigidity did not interfere with the necessary conditions of good teaching, such as the avoidance of boredom, the maintenance of interest, and respect for the individuality of the students. It is intended later to compare the results of other procedures with the results of the pedagogical method here employed. We used the means that seemed likely to lead to the most marked success.

Each exercise was begun on Monday morning, and, as already stated, the students had the words and sentences before them for a space of twenty minutes. On Wednesday, at the expiration of forty-eight hours, they were asked to write down all that they had retained. Then the Italian was once more placed before them and they were asked to write out a translation. Data were thus secured for a comparison of their powers of free reproduction with their powers of recognition, recall through association, etc. During the progress of the experiment the learning process was discussed in class, and in addition the students made two written introspections, one at the time of the fifth exercise, and the other five weeks after the last exercise.

About the close of the semester, four weeks after the eighth exercise, all the Italian sentences and words were once more submitted and translations again obtained. This was a crucial part of the experiment and gave evidence, as we shall see, of the superiority of the short sentence over the word as the unit of modern-language instruction. The success of the mem-

bers of the class in learning the exercises was also compared with their previous record in language-study, college standing, general ability, etc. Naturally, therefore, the experiment throws light on the learning process in general, and not merely on the specific question of method, which it was the initial purpose of the investigation to answer.

Table I shows the results of the first weekly test. It seems to call for separate treatment, because it was given to the class without much explanation of what was required of them. This manner of presentation was intentional. It discovered the native powers of retaining images, and furnished a basis of comparison of subsequent work in which the will to excel played a more important part. The letters in the table represent the members of the class, of whom B, F, and G were men, and the others women. All were seniors in college except G, who was a graduate, C, who was a junior, and H, a sophomore. The first column of figures represents the number of Italian words recalled from the sentences and separate words after an interval of two days. The second column of figures represents the value in per cent. of the translation of the sentences at the same time, while the last column represents the value in per cent. of the translation of the separate words.

TABLE I

	Free Reproduction	Translation of sentences	Translation of words
A	14	86	85
B	11	85	80
C	10	56	85
D	9	63	100
E	8	70	70
F	5	40	90
G	1	40	60
H	0	11	90
I	absent	—	—
J	absent	—	—

One finds here at the outset a considerable correspondence between free reproduction and ability to translate the sentences. G, who was inferior in the power of direct recall to F, and equalled him in the translation of the sentences, shows marked superiority in the later studies, where his maturity and perseverance make themselves felt. The differences between C, D, and E do not call for elaborate comment, but D, as she said, waked up towards the end of the twenty minutes to the fact that a test in memory was in progress, and applied her attention with characteristic energy to the translation. E,

as she later recognized, was greatly aided in translation by a special ability to associate the parts of the English equivalent. She wrote, "In translation if I could remember what one or two of the words meant I could recall the translation of the whole sentence." This ability was particularly noticeable in this first exercise, where the seven sentences attempted were translated perfectly.

Table II shows the improvement in free reproduction during the two months the experiment was carried on.

TABLE II

March	1	8	15	22	29	April	5	19	26	Total	Average
A	14	24	47	37	64		52	27	44	339	42.37
B	11	13	30	33	31		42	62	61	283	35.37
C	10	29	—	40	—		—	19	23	121	24.2
D	9	9	12	21	—		82	—	50	129	21.5
E	8	6	8	28	26		27	15	15	133	16.62
F	5	7	12	15	—		17	12	15	83	11.85
G	1	20	20	19	37		43	32	30	202	25.25
H	0	5	16	—	—		—	24	15	60	12.
I	—	36	36	44	56		—	39	48	259	43.16
J	—	19	16	—	—		61	58	44	198	39.6
Total	58	168	197	237	214		270	318	345		
Average	7.2	16.8	21.8	29.6	42.8		38.5	35.3	34.5		

Even these data, limited as they are, serve to show the dependence of progress in language-learning on the improvement in free imagery. How much success in the exercises resulted from conscious efforts to make the images of the Italian more vivid is apparent from the written accounts by the class of their methods of study. A, whose aptitude for this work was marked throughout the experiment reports, "I think my method was almost entirely by association of the Italian in half visual, half auditory imagery with the English in auditory (with a very much smaller degree of visual)." B, who made steady and brilliant progress, was very clear as to how he learned. "In learning the Italian," he wrote, "whenever I could hear the sentences and words spoken, they became fixed in my mind; during the latter part of the experiment, however, I had obtained some idea of the 'sound' of the language, and so just the sight of the words was often enough to fix the sound in my mind." I transcribe the seventh exercise and this student's reproduction of it after an interval of two days.

Morir!sì pura e bella!
Morir per me d'amore—
Degli anni tuoi nel fiore,

Morir!si pura e bella,
Morir per me d'amore
Degli anni tuoi nel fiore,

Fuggir la vita!
T'avea il cielo per l'amor creata.
Ed io t'uccido per averti amata!

Fuggir la vita.
T'avea il cielo per l'amor creata,
Ed io t'uccidopper averti amata.

Vedi?di morte l'angelo
Radiante a noi si appressa—
Ne adduce eterni gaudii
Sovra i suoi vanni d'or,
Su noi già il ciel dischiudesi—

Vedi?di morte l'angelo
Radiante a noi si appressa—
Ne adduce eterni gaudii
Sovra i suoi vanni d'or.
Su noi gia il ciel dis—

grosso	grosso
dimorare	dimorare
cacio	cacio
zanzara	zanzara
moto	moto
piangere	piangere
curiosità	curiositá
lutto	luto
raggio	raggio
braccio	braccio

On this same occasion all that F could recall were the following unconnected words: nauzaza dimorari, braccio moriri, bella, leggio, amore grosso, moto, vedi, morte, gaudii curiosita, pura.

That such differences exist in the powers of free reproduction of two classmates working under the same general conditions will surprise all perhaps except experienced teachers. One feels that in the learning of foreign language the vividness of the imagery is something that should not be neglected.

F writes, "Visual imagery played the heaviest part in my process of learning Italian." He notices, however, that he moves his lips in learning the exercises, and concludes that motor imagery may have played some part. C reports that all her memory depended on visual imagery. "If I could not recall the place in the sentence and on what part of the page the word was, it was hopeless to try and recall the word." In spite of this consciousness of location it is remarkable that C's memory was rather for detached words. Her exercises were lacking altogether in the continuity that marked the work of the auditory-minded B, already quoted, and that of the motor-minded J, given below.

D says, "When the work was put on the board, I read a sentence several times, and then shut my eyes and repeated it until I could see it clearly in images." She tried for a while writing the words down, "but it did not make much difference, in fact it retarded my memory of them all, for it took more time and made two kinds of images,—printed and handwritten. It is much easier for me to retain one image." Quite in contrast with this experience is that of J, who gives a striking account of her method of learning. "It is almost im-

possible for me to memorize anything without writing it down,—in fact, it is impossible for me to learn any hard lesson that has to be memorized in any order of ideas, without a pencil in my hand." "The first sets of Italian sentences, which I tried to learn by visualization or by an effort of memory alone, were *entirely new* to me when we were re-examined in them, whereas the others, which I had learned by writing them down, were as old friends." She thinks she could never remember which words follow which. Within the sentence, as the subjoined exercise shows, her memory for order is remarkably good when she writes the work out. Once more speaking of her way of learning things she writes, "The *proportion* of them and the *feeling* of them impress me more than anything else; I can't describe it, but it isn't the *look* of a thing alone."

Quando arriva il treno a Roma?
Viene con me il più presto possibile.
Non feci nessuna attenzione.
Quanto debbo pagare pel servizio?
Come stà?Stà bene?Si, Signora.
Preparatemi un bagno caldo.
E Lei già stato a Venezia?
Il letto non è preparato.
Farò tutti i miei sforzi.
Aspetto risposta per il portatore.

Arrosto
cervello
insalata
uova
frutto
pomidoro
pesce
colazione
cena
riso

Comme stà?Stà bene?Si, signora.
Preparatemi unbagno caldo.
Faro tutti i miei sforzi.
Quanto debbo pagare pel servizio?
Quando arriva il treno a Roma?
Il letto non è preparato.
Feci non nessuna attenzione.
E lei gia a stato Venezia?
Vieni con me il più possibile presto.
Aspetto risposta per il portatore.

uova
cena
colazione
frutto
insalata
cervello
arrosto
riso
pomidoro

This was the sixth exercise, but J had studied only two of the previous sets of sentences and words, and had not done remarkably well in them. This splendid performance, after two twenty-minute lessons in Italian, indicates the value of discovering one's own best method of learning, perhaps previously to any extended work in a new study. J's marked improvement in translation, shown in Tables III and IV further justifies our procedure, which emphasized the importance of gaining a vivid image of the foreign words and sentences.

H, whose record was by no means encouraging, seemed to herself to fail because the circumstances of the recitation made it difficult for her to use the imagery most congenial to her. She is ear-minded, but no drill was given in the foreign sounds,

and after the first few exercises no special pains were taken to pronounce the Italian, as the class did not seem to demand it.

E says, "In learning the words and sentences I found that I could learn them better when I would spell them in a whisper so that I could hear them." "I wrote the words also, and spelled and pronounced them as I wrote, and I found this very helpful." G writes, "I tried working on the Italian alone and committing it by rhythm, and auditory, visual, and motor imagery, but I found the method unsatisfactory." "The most satisfactory was to learn the English first and then get the Italian; ask about any particularly hard part as this seemed to fix the words; and then as quickly as I could after class reproduce all I could remember in writing and commit it thoroughly." Another member of the class, I, "learned the exercises by visual and auditory imagery, more easily when the two were combined."

The Tables that follow, III, IV, V, and VI, serve to show how these learners of various types succeeded in learning the translation of the Italian words and sentences, and how their power of retaining the latter compared with that of retaining the former. Table III gives the percentage values of the translation of the sentences made by the class two days after the first sight of each exercise.

TABLE III

									Total	Average
A	86	95	100	100	100	88	100	100	769	96.12
B	85	80	100	100	100	100	100	100	765	95.61
C	56	92	—	90	—	—	95	92	425	85
D	63	78	75	93	—	98	—	100	507	84.5
E	70	95	65	78	81	67	58	95	609	76.12
F	40	60	70	67	—	80	70	90	477	68.14
G	40	72	80	95	100	100	100	100	687	85.87
H	11	50	25	—	—	—	70	90	240	48
I	—	86	60	82	75	—	100	100	503	83.83
J	—	74	60	—	—	95	100	100	429	85.8
Total	451	782	635	705	456	628	793	967		
Average	56.3	78.2	70.5	88.1	91.2	89.7	88.1	96.7		

In conjunction with this must be considered Table IV, which gives the results in percentages of the translation of the words during the first eight weeks of the experiment.

We do not find so marked the tendency to improve in the translation of the words as in the translation of the sentences. The fourth table seems more subject to fluctuations, perhaps because it is sometimes possible to guess the meanings of the

TABLE IV

									Total	Average
A	85	100	100	100	100	88	100	100	773	96.62
B	80	98	90	100	100	100	100	100	768	96
C	85	95	—	95	—	—	80	80	435	87
D	100	85	50	90	—	98	—	100	523	87.16
E	70	95	65	100	60	90	60	60	600	75
F	90	60	50	45	—	100	60	30	435	62.14
G	60	65	60	90	100	100	60	90	625	78.12
H	90	75	40	—	—	—	100	30	335	67
I	—	95	75	90	100	—	100	100	560	80
J	—	75	80	—	—	100	100	100	455	91
Total	660	843	610	710	460	676	760	790		
Average	82.5	84.3	67.7	88.7	92	96.5	84.4	79		

words. Moreover, what is most important for our experiment, on this first translation the averages, both collective and individual, are higher in the fourth table than in the third; *i. e.*, there is greater success in recognizing the words than in recognizing the sentences. If we combine the records for the words and sentences, we find that A, B, C, etc., secured the following percentages respectively: 96, 95, 86, 85, 75, 65, 81, 57, 81, 88.

Four weeks after the eighth exercise, as already stated, all the exercises were resubmitted. The results are recorded below. Table V represents the translation of the sentences, Table VI that of the words.

TABLE V

									Total
A	86	100		95	100	100	100	100	681
B	67	79		65	95	80	100	80	566
C	29	84	—	67	—	—	80	74	334
D	39	54							
E	44	34		50	55	50	55	74	362
F	22	25	30	37	—	57	20	30	221
G	50	62	22	80	90	82	82	78	546
H	34	12	15	—	—	—	50	12	113
I	—	75	78	75	75	—	98	100	501
J	—	71	36	—	—	95	100	50	302

Comparing the totals of Table V with the comparable sums from Table III, we find that the best students most nearly approximated their former record (A even surpassing hers), while the students who had made the poorest records in the first place with the exercises now fell the furthest below their

TABLE VI

									Total
A	90	92		90	100	85	98	100	655
B	85	90		75	90	98	80	55	573
C	34	90		60	—	—	40	60	284
D	90	80							
E	50	71		70	40	70	30	10	341
F	80	50	10	20	—	50	30	20	260
G	60	78	40	40	50	70	25	35	398
H	40	72	40	—	—	—	40	20	212
I	—	65	60	70	70	—	70	70	405
J	—	60	36	—	—	100	55	35	286

own former performances. The following figures represent in percentages the relation of the marks taken on the final test to those taken previously. A—101, B—85, C—78, D—E—64, F—46, G—79, H—47, I—99, J—70. Making a similar comparison of Table VI with Table IV, we find again that the superior students came more nearly to their previous records than did the inferior ones. The following figures represent the relation in percentage of the final test on the words to the result on the first test: A—97, B—84, C—65, D— , E—62, F—59, G—63, H—60, I—72, J—62.

Again, placing together the results of these two comparisons, we have a means of measuring the ability to retain sentences with the ability to retain detached words.

A	101	97
B	85	84
C	78	65
D		
E	64	62
F	46	59
G	79	63
H	47	60
I	99	72
J	70	62

Here there is seen to be an advantage in retaining the sentences except in the case of two students. These were, it is interesting to note, as far as success in learning the exercises is concerned, the two weakest students in the class. The better students recognized expressly the advantages of studying languages by sentences rather than by words. A, in order to learn the detached words, first made sentences of them. On this point B writes, "As to the detached words and the complete sentences or rather ideas, I found it much easier to memorize the latter. At times it was necessary to resort to some purely mechanical method in order to retain the separate

words, such methods as arranging them in a sentence (when it really became learning sentences or ideas), arranging them in alphabetical order," etc. Still another student, I, writes, "In learning the separate words, I found, at the time of our review, that I could not recall some of them, while it was not difficult to recall the sentences entire; in other words, I could learn a whole sentence and remember it much better than one isolated word. So were I to learn any new language, I should certainly do so, not by cramming a lot of unrelated words into my brain, but by words connected in meaning in sentences."

The range of individual differences was as marked a feature of the final test as of the rest of the experiment. Below are given the translations by A and H of the eighth exercise four weeks after it was first presented.

Exercise VIII	A's translation	H's translation
Il treno è in ritardo.	The train is late.	The train is late.
La supplico di non abbandonarmi.	I beg you not to leave me.	
Ha egli scritto qualcosa d'altro?	Has he written anything else?	
Ha avuto la miglior parte.	He has the best of it.	
È superiore alla mia immaginazione.	It is beyond all my imagination.	superior–imagination
Il sole mi dà noia	The sun annoys me.	
Dove c'è una pensione?	Where to find a lodging place.	
Non è questo troppo caro?	Is not this too dear?	
Non avete un libro simile a questo?	Have you not a book like this?	
È questo il suo più recente lavoro?	Is this his most recent work?	
legare	bind	
edizione	edition	edition
ponderato	heavy—deliberate	hesitate
sarta	dressmaker	tailor
mosca	fly	
mano	hand	
lato	side	late
tirare	shoot	talk
molto	much	
pianura	plane	

While A translated all the sentences and all the words with a fair degree of accuracy, H succeeded with only one sentence and one word among the separate words, and that, edizione, one readily guessed. When you consider the various types of imagery, the various methods of study, and the different powers of retention of the group under examination, you

realize how complex is the instrument on which the instructor of even a small class attempts to play. Some of these differences are undoubtedly inborn, while others are the result of previous experience.

Swift, in the experiment already referred to, paid special attention to the effect on the learning of Spanish prose composition of previous school work in German and Latin. He recognized an initial advantage, which did not vanish during the limited time the investigation was in progress, on the part of those who had been taught other languages before taking up Spanish. He does not explain this advantage as the effect of language discipline in general, but says, "It cannot be doubted that the substance of information carried over from Latin or German would give beginners in a new foreign language a decided lead over classmates who were receiving their first introduction to work of this sort." The students in my experiment were conscious of the effect of their previous work in language on their ability to learn Italian. A says, "I keep the English equivalent—and the French or Latin, if that is nearer—in mind." She also made use of all the grammar she could construct for herself from the examples. B writes, "Undoubtedly my experience with other languages helped me greatly, especially Latin and French. At times, except for the spelling, it would seem to me that I was translating Latin or French." In C's exercises I frequently found the French equivalent substituted for the Italian word. She was taking a course in French at the time the experiment was in progress. On the other hand H felt the lack of previous experience in language study and she wrote, "The exercises were hard for me at all times because I have never taken much language work, therefore it is impossible for me to see the derivation of the words, or to associate them with other translations." What she felt she lacked, and what the others were conscious of availing themselves of, was naturally what could be described as "substance of information."

Table VII represents the number of years spent in the study of foreign language by the members of the class at high school and college. The grade of work done at college is indicated by the letters a, b, and c. The figures following these letters show the number of semester-courses.

A careful consideration of this table reveals that as far as their experience in the study of foreign language is concerned, the members of the class rank as follows: A, B, J, E, C, G, D, F, I, H. To what extent this order corresponds to that of the excellence of the students in the learning of the Italian exercises we shall see more definitely by and by. In the meantime it is manifest that however important imagery may

TABLE VII

	High School				College			Total
	Greek	Latin	French	German	Latin	French	German	
A	1	4	3		2 a3b1	1 a2	2 a 4	13 yrs.
B		4	1		1 a1b1		4 a11 b3	10
C	some	4		2		2 b4		8-9
D		4		1.5	1 b1c1		2.5 a 4 b1	8
E		3				2 a2c2	4 b 6c2	9
F	1	4					2 b 2c2	7
G	1	4		1.5	1 b1c1		1.5 a2b1	9
H		2		1.5			1.5 b3	5
I		4					1 b 6	5
J		2.5		2	2.5 a3b2c1		2 a 2b2	9

be in the learning process, apperception is a factor that cannot be neglected. How far definiteness of imagery depends upon the apperception this is not the place to discuss. I, who is a mature student, knew how to help out her learning by conscious associations; her mind "was always seeking for some comparison with something that had been previously assimilated." She concludes that her "natural method of memorizing is the *logical* one." G likewise helped out his rather poor imagery by learning the translation and consciously associating the Italian with the English. He made it a point, as we have seen, to ask about sentences that he found it hard to memorize, and to thus form associations by little discussions in class. E was also very conscious of her associative processes. She writes, "The method that I found best in memorizing the Italian was in relating the Italian meaning to the English, and by writing down the Italian and by spelling it out as I wrote it, so that I could hear the sound of the letters and also see the words."

The general college records, inclusive of the foreign language credits, of the members of the class, are given in Table VIII. The figures represent the number of examinations passed, or rather, the number of half-yearly courses taken. The letters at the heads of the column are the grades obtained.

As already stated, C was a junior, G a graduate, and H a sophomore. It is fair to say that the following represents the order of these students as far as their college record is concerned: A, B, J, I, D, G, C, E, F, H. That the order established by their college record is that of their general ability I should hesitate to say. Qualitative rather than quantitative differences are uppermost in mind in making a general comparison of the members of the class. For the grades that

TABLE VIII

	A	B	C
A	38	7	
B	23	13	1
C	4	22	5
D	12	27	3
E	2	33	11
F	1	33	7
G	11	32	3
H		10	10
I	13	33	
J	18	19	6

they received in the course in experimental pedagogy, the writing of a thesis rather than the passing of an examination was the decisive thing. As the choice of a subject and the making of the investigation were left largely to the student in each case, their grading might be supposed to afford a clew to their general intelligence and executive ability. I find that the grades, represented this time by numbers, were as follows: A—1, B—1, C—4, D—1, E—3, F—3, G—1, H—2, I—1, J—1. Nothing, therefore, in the standing finally secured by these students in this course would warrant one in taking exception to the grading obtained in their general college record. Of course in speaking of general ability one naturally asks whether effort and will-power do not at times offset native aptitude. The presence of a steady purpose in some cases and its absence in others cannot well be overlooked. Where the purpose was strong, however, it is noticeable that it led to new methods of study, more conscious associations, and more vivid imagery. The student who felt the lack of motive to learn the exercises,—which lack certainly gave a touch of artificiality to our work but did not lessen its likeness to the usual school drudgery,—failed to find a sufficient incentive to make the preparation of a good thesis worth while, and the college record shows that the impending final examination failed to arouse to energy the latent power one continued to have faith in. The better students good-naturedly took it for granted that the play was worth the pains, or did the work as one of the most brilliant expressed it, "simply from the habit of doing what we are told." Whether the docile or lethargic promises more for the future we shall not now take time to discuss.

A steady effort was made to render the exercises interesting as far as the nature of the work permitted. The introduction of the quotation from Dante in the fifth exercise, and the more difficult song from Aïda in the seventh exercise, were intended

to relieve the monotony, or rather to anticipate it. The effect can be traced in the tables. As a rule, the short sentences were such as might be of value to travellers in Italy. One of the members of the class writes, "Sometimes, if there was presented a nice little conversational sentence, I would say it in Italian to my friends—as: Che mi consigliate di fare? Such remained longer by me than the rest." B says on this point, "Some lessons, furthermore, were more readily memorized than others, such, for example, as the selection from the opera, and certain common but very useful sentences, as Il treno è in ritardo, etc. Here it is undoubtedly true that interest plays a very important part in my learning process. Where this feature was lacking, it was necessary to resort to will power; this was only necessary, however, in two or three cases and then, I believe, interest failed solely from physiological reasons. I found it quite possible to memorize the Italian of every lesson, but the less interesting it was, the greater effort it required." "Of course the shortness of the exercises prevented the interest from flagging." A says, "I doubt whether I could have studied much longer than twenty minutes at a time as hard as I did." This student also notes, "I remember some of the unusual constructions best, because I paid most attention to them. I forgot some of the most natural words and constructions, because they were so natural that I did not pay particular attention to them."

In Table IX a summary is made of the main results of this investigation. By it we are enabled to compare the students at a glance in the following respects: general college record (C. R.), grade in experimental pedagogy determined largely by a thesis (T.), free imagery of the Italian on the first trial of all (I.), average record in free reproduction after a two days' interval (A. R.), translation of the sentences after a two days' interval (T. S.), translation of the words after a two days' interval (T. W.), retention of the sentences (R. S.), retention of the words (R. W.), experience in foreign language study (F. L.). For the students' grades in the thesis work only four numbers were used; except in this instance the figures represent the order of excellence in the class.

The investigation increases my confidence in the value of the general college record, and leads me to believe that a study such as this is capable of yielding simple means for determining general ability. The degree of vividness of the imagery, whether it be visual, motor, auditory, or of a mixed type, is a factor of the first importance in the learning process. Subsequent experiment with the exclusive use of this or that type of imagery will determine whether with a heterogeneous class a better average result can be obtained than in this ex-

periment, in which we aimed at reproducing the classroom conditions as nearly as possible, under the limitations already mentioned.

TABLE IX

	C. R.	T.	I.	A. R.	T. S.	T. W.	R. S.	R. W.	F. L.
A	1	1	1	2	1	1	1	1	1
B	2	1	2	4	2	2	3	2	2
C	7	4	3	6	5	5	5	4	5
D	5	1	4	7	6	4			7
E	8	3	5	8	8	8	7	6	4
F	9	3	6	9	9	10	9	8	8
G	6	1	7	5	3	7	4	5	6
H	10	2	8	10	10	9	8	7	10
I	4	1		1	7	6	2	3	9
J	3	1		3	4	3	6	6	3

One naturally asks in conclusion what hints for actual classroom work can be gathered from a study of this sort. Would it be wise for the teacher of foreign languages to cast aside dry vocabularies, and to teach words only in their connections? Would it be worth while to construct interesting dictionaries, in which no word would be given without a valuable example of its use? Should we, before plunging into the work of teaching a foreign language, attempt to find out something of the previous experience of the student in language study, and of his characteristic methods of learning? Should we limit the length of the recitation to half an hour? Should the recitation be so conducted as to allow full liberty to individual differences in the learning process? To some of these questions we feel prepared to give a decided answer. For example, our study leads us to sympathize fully with the humorous appeal, in reference to method of study, of one of the best students: "Give me liberty or give me death!" Most of these questions, however, will require for their solution the joint consideration of many theorists and many practical instructors. Meantime it is encouraging to note that the matter of classroom methods is being recognized as accessible to a treatment more promising of definite results than that heretofore employed. A great gain would be made for scientific pedagogy if trained teachers of foreign language could be led more generally to undertake experiments to answer some of the problems that confront them, or even if they could be induced to put on record their more striking successes and the exact procedure by which obtained. At the same time the aim of experimental pedagogy in this as in other fields must be not to ignore nor seek to upset the work of the practical teacher, but

to submit data for his consideration, to afford a scientific basis for pedagogical skill, and so far as possible to make of general avail the triumphs of pedagogical tact.

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COMMUNICATION

By Frank A. Manny, Kalamazoo, Michigan

"Do not think the youth has no force, because he cannot speak to you and to me. Hark! in the next room his voice is sufficiently clear and emphatic. It seems he knows how to speak to his contemporaries."[1]

Compared to many European class rooms the American teacher and student have made considerable advance in establishing lines of communication. It is hard for some German teachers to understand that instructor and pupil can be "contemporaries" in any real sense. I recall the look of astonishment upon the faces of good men and boys in that land when after some sturdy boy had brought me my coat and helped me put it on I would turn to assist him with his coat. Yet our advance in these matters is slow. One can still find schools in which those tools which have formed so great a part in the progress of civilization—I refer to mutual aid and communication—are the cardinal sins.

In our interest in developing the constructive work in material of three dimensions and the representative and creative opportunities in drawing and painting, we have not always taken account of the extent to which language can become a means of communication in a creative and active sense. The newer developments in music, especially in primary classes, have reacted upon the language recitations. In some schools there is co-operation between these departments, and visitors who are concerned with English problems are directed to spend a part of their time in certain music classes because there they will find some of the most effective constructive work in gaining control of the mother tongue.

Those who have had experience with the more substantial experiments in correspondence study have often remarked on the opportunities for communication developed in that department, so that in many cases students have found themselves able to do more responsible work in correspondence with an efficient teacher than had seemed possible in the classroom. Here, as elsewhere, it is possible that the class instruction can

[1] Emerson: Self Reliance.

become a more adequate social tool by larger inclusions and the use of suggestions from these newer fields may help in the advance.

I have no fault to find with our usual tools in so far as they serve their purpose. The usual recitation methods—reviews, simple tests, formal examinations, topics, questions and answers, students' inquiries, theses, dissertations, conferences, etc., establish sufficient communication in a large number of instances. The laboratory idea carries over more and more into a wider range of interests and the development of oral speech in play and dramatic activities promises more efficiency. One of the significant factors in the better schools of the day is the extent to which it seems possible to carry regard for the individual without danger of rendering him less useful in society. Professor Cooley in his latest book has shown that while modern society makes it increasingly difficult to preserve the individuality that came from isolation, it offers constantly greater opportunities for that higher individuality that can come only through choice. The elective system has left a trail of absurdities and waste. Yet its tendency has been decidedly for progress. We have been slow to appreciate that its significance in earlier years will be found to be as great as it now is in the secondary and higher schools and, further, that some of its greatest achievements will be in the field of method and operation. It has been costly to learn what it can afford us in subject matter, but its larger usefulness may well be in giving to individual students a wider range of means of communication, through which the needed habits and conventions of life can be organized, with reference to social responsibility, without so great sacrifice as is sometimes made of initiative and individuality.

During the past fifteen years my work first as a teacher of English, and later of education, has led me to work upon this problem in my own classes ranging through the high school, normal school and the graduate department in two universities. My work as supervisor, superintendent and adviser of several schools has given me further occasion to see many aspects of the problem in the kindergarten and the elementary school.

A valuable study could be made of the improved tools that have come into our English classes through the activity of a few live men in certain universities. I have used many of these but found myself in need of some means that might serve as a centre and afford continuity. The device that served best is what students call "the reading list," or, better, "the weekly communication." On a certain day of each week each student hands in a paper on which he is asked to note

the references to the reading he has done during the preceding week. I have found it an advantage to have this a regular exercise as it then rests on a basis of habit and can be performed economically. While it is thus a definite requirement the required element is placed at a minimum and can be met by the use of a very few minutes' time. Upon this basis of regularity I find that an interesting superstructure of voluntary communication grows. There are some students who never get beyond the simple necessities, but usually the list of references in the particular subject comes to include material in other courses and relationships are suggested and pointed out by the student,—quotations are copied and the habit of abstracting and outlining is developed. Further than this there is a tendency to make this exercise an occasion for attending to the more mechanical questions which usually take class time or involve long waiting for conference, or more often are let go at much loss because it would require so much effort to bring them to the instructor's attention.

The communication would be well worth while if it accomplished nothing more than the exercise it gives in discrimination and in bringiug to my attention the types of material which interest particular students, together with its function as a periodical clearing house. But further than this it has its best service in the use that is made of it to raise problems and to record impressions. Most young people like to write out their thoughts. For many the diary or journal is a real means of catharsis, but often a similar writing has greater value if it is known that it will have a sympathetic reader who will briefly comment and suggest relationships and connections. Naturally each week presents a large amount of material which can be marked for class use.

The frankness of statement and the directness of application oftentimes bring out erroneous views and serve to keep the instructor in touch with the actual muddy current of thought in the student's mind as well as his own clearer current that has been clarified by years of study. I have found it desirable to keep in a closet a "Lest we forget" shelf of books to which I turn from time to time in order to have a better understanding of the contents of older students' minds. There are curious cross currents to be found in these minds and canals side by side which are quite unconscious of each other's existence. I was once walking with an earnest young man of twenty-three who had taught two years. At this time he was taking less than usual work in order that he might have more time for reading. To my surprise I found that this reading was in the works of Horatio Alger, Junior! Yet following up a clue which a communication had given me I found that he

had made a list of important events in his life and one of these was the reading of Emerson's Compensation, which he discussed with intelligence. I had just read a barely passable examination paper by him, but in his communication there came up a reference to impeding habits which showed a comprehension of the subject far beyond that evidenced by the average student, and a sensible application of the idea to opposition to spelling reform and other like movements.

Following are a few extracts from the weekly communications representing the work of students in a normal school:

"During vacation I read about one quarter as much as I usually do during vacations and tried to observe more. I read enough of Francke's History of German literature and Scotts' Social Education to get their aim, point of view and main or general plan of treatment."

"I read some extracts from Tom Sawyer. Had read it some years ago. Wanted to see if I saw it in a different light. Think I found it nearly as interesting, but the interest lay not in the adventures of Tom but the causes and interests that brought them about.

"I tried one of Alger's books the same way. Think they are too much exaggerated to find even a study in them.

"I thought I would see what I could make out of some of Shakespeare's works. Can still see many places where there might be many meanings. But I think I can get down to the essence of the work a great deal better.

"I am studying the life and letters of Huxley. From what I read I think that he made himself a factor in changing his environment.

"I try to keep in mind the general contents of several good periodicals—as the Survey, Manual Training Magazine, etc."

"I. My work this week has been what I call a clearing up. I have been writing note books for all my subjects, getting points I did not understand cleared up, and trying to get my work into some sort of shape for the summer term. Outside of this I have done no work.

"II. Speaking of woman's rights I noticed the following in a paper this morning: 'After the style of hats women are wearing this spring, they still claim that they do not have their rights.' Looks to me very inconsequential!"

"During this term of Psychology of Occupations I have thought a great deal more about my course of study than I ever had before. Before I came to school I had heard only these arguments for Domestic Science, that it teaches a girl to be a home-maker and if she must depend upon herself, teaching it is a good way of earning money. Now I have a little broader view of it. It seems to me that the whole problem is this: In many homes to-day, women are putting the household industries into hands of professionals and are trying to do bigger things out in the world; in many other homes women are trying or pretending to make homes and they do not know how, so that improper nourishment, unhealthful conditions and many other bad things are the result. There are two ways of meeting the situation, either of putting all household duties into skilled hands, taking the children into the schools and giving them there all the things which are or were given in the best homes; or of teaching home-making in the schools, in clubs and through the press so that the present or more particularly the rising generations of women will know how and will be home-makers. In the former case,

I can see no reason for putting Domestic Science and Art in the public schools, in the latter case there is need for it in every school.

"In the Home Journal of Economics there is an article, 'A Campaign for Home Making.' The author describes the conditions of many homes, the lack of knowledge of food, clothing, and the care of children, and says: 'Is there a more fruitful field for professional teachers of home-making than this?' Do I have the right idea of it?

"*An after thought.* Domestic Science may at first look to be too materialistic, too much stress being put upon the external and physical rather than on the internal, but this is not the true meaning. It is a necesary step to higher things.

"'Home Economics stands for the freedom of the home from the dominance of things and their due subordination to ideals.'"

"I do not agree with this report (Committee of fifteen) on the methods of teaching arithmetic. I have noticed that pupils do better work if not allowed to use texts until about the sixth grade. I get much more and better ideas out of the Michigan Manual than I do this report."

"I. Was Pestalozzi a transcendentalist? In his New Year's Address of 1809, he says: 'The divine nature which is in you is counted holy in you. You are among us what the divine nature within you and without you summon you to be. We oppose no vile force against your gifts or your tendencies; we constrain them not,—we only develop them. . . . What I seek is to elevate human nature to its highest, its noblest; and this I seek to do by love. Only in the holy power of love do I recognize the basis of the development of my race to whatever of the divine and eternal within its nature.'

"What I understand he means by 'elevate' is to open new things to the individual as he grows and is ready for them. I believe in Pestalozzi.

"II. Compulsory Education laws of the State of Michigan, 1907.

"III. I also believe in Froebel, when he says, 'In all things there lives and reigns an eternal law. . . . This all controlling law is necessarily based on an all pervading, energetic, living, self-conscious, and hence eternal unity. . . . This unity is God.'"

"'Education consists in leading man to . . . pure and unsullied consciousness and free representation of the inner law of Divine Unity, and in teaching him ways and means thereto.'

"I think Misawa's treatment of Pestalozzi and Froebel is excellent. (Modern Educators and their Ideals, by Tadasu Misawa, Ph. D.—D. Appleton, N. Y.)"

"I. 'School and Society.'—Dewey. (Problems worked out—to make school not isolated from home and society but in co-operation with them. His four problems are worth remembering.)

"II. 'Social Education.'—Scott. (Good. Have not done much reading in this.)

"III. 'Little Journeys to Homes of Great Teachers—Booker T. Washington.'—Elbert Hubbard. (A very interesting account of Booker T. Washington's boyhood and work at Tuskegee.)

"IV. Carlton, ch. 12. (A very fine account of continuation schools and industrial education. Worked out very well.)

"V. Misawa. 1. Table of Contents. 2. Preface. (I consider this one of the best books on modern education. A well organized work and interesting.)

"VI. Life of John Stuart Mill, from Rand's 'Modern Philosophers.' 'Elimination is probably as necessary for the true advancement of science and humanity as accumulation.' (I find that Mill

was an empiricist, individualist and associationalist. I cannot find an adequate definition or meaning for the term associationalist. Does it mean utilitarian? Does it hold something of the idea contained in the quotation before? Elimination in so far as the thing eliminated is useful and corresponds with previous experience?)"

"I. 'Education of the Indian,' Vol. II, Butler. 'Education in United States.' (I had never realized before that so much and so great work had been done for the Indians. It is certainly a rich field for any one concerned with the race problem to-day. It is just as interesting as the negro question, except that public opinion is not so strongly against the Indian.)

"II. 'School Management,' Dutton. (Shall take time some day to read this through carefully. It is a book every teacher should own. Have read greater part of first half.)

"III. To show or to illustrate the relation of school to society. I found this statement in Dutton's 'School Management': 'The school exists to create a better social life.'

"IV. 'The problem is not one of correlation, but of differentiation,' Dewey. There is much the same thought and same idea in this as in the statement, 'Elimination is probably as necessary for the true advancement of science and humanity as accumulation.' The one contains the idea of distinction, the other of extinction; discrimination and separation?"

"Chapts. I. and II. 'School and Child,' Dewey. A portion of 'The Young Malefactor,' Travis."

"'Plain facts about Public Schools.' Sam. Orth in Atlantic Monthly, 3, 09. This was a very good article. If the schools are really in this bad condition why not remedy them? After all, is society civilized? Look at the school system, at the 400, at the social relations. To me it seems doubtful. Man is not yet in his own and will not be for years to come."

"This week has been a great deal of going over work for me. I have gone over Patten and read much of it. I read some in Travis's 'Young Malefactor.' The little Michigan bulletin of laws was gone over. I read some of Dopp. 'The Teachers College Record' was new to me and in it I read the material by MacVannel on the educational theories of Herbart and Froebel. Besides this and some magazine work I have had considerable reference work to do in cooking and sewing."

"I have been following up references on special sense of pain which involved reading in Wundt, Titchener, Groos, Baldwin, King, Gulick and others. I doubted at the beginning of the reference work that there was such a sense—as many of the class do yet."

"Day, Squire Phin. A book to read for enjoyment. I have made a determination to read at least one such book or as much as I have time for each week. Too much for one week?"

"The discussion in class, the other day, of the Sunday ball game was a shock. Without attempting to reason it out or even to think it over, I have always hurriedly thought, 'Of course it is not right.' It fairly took my breath away then to have one of the girls come out and declare it a good thing. Most of all her reasoning was such that I found it impossible not to agree to it as a theory or principle, and yet it is on principle that it is to be opposed!"

I find it impossible to include extracts from some of the most effective material because it is written in so intimate a manner as to lose its significance when isolated. I trust, how-

ever, that this statement will serve to show the serviceableness of this tool. I am constantly impressed by the results it aids in bringing about by relating one week's work, or one year's work to that of another. There is a continuity established which is an important factor in gaining effective control of material and processes. I find frequent references to problems raised by the instructor or by students in other terms or courses. Again, a new point of view will suddenly appear and a note will be found sometimes in the midst of an examination paper, as, "I see this matter of Sophie's education [in Emile] in a new light, and will write this out in my next communication after I have had time to think it through."

HER LITTLE GIRL

By HARRY PREBLE SWETT, Franklin High School, Franklin, N. H.

The following is an account of an imaginary playmate that had a continuous development of some ten months, and an existence of over two years. The child, in whose imagination this playmate lived, is now a being of flesh and blood, who may be designated by the colorless name of C. The imaginary companion has always been called by C her Little Girl, and no other name seems appropriate. The facts, here recorded, were noted at the time they occurred, and are as accurate as the writer's personal equation has made possible.

This imaginary child is associated, more prominently, with C's moral development, and allows an insight into the mental struggles of a child learning to control desires in the effort to live rationally. Accordingly, I shall give, briefly, along with the biography of the Little Girl, some of the steps in C's mental development, which have an ethical significance.

At the time when the Little Girl was first noticed, C was nearly three years and eight months old. The Little Girl was, at first, simply an imaginary playmate to talk with, and to react to, in many ways, as if a real companion. She was present a good deal of the time for a month, when I tried to get a description of her characteristics. All that I could then learn of the Little Girl was that C regarded her as another child, who had C's own name.

For some time before this, C had played with imaginary objects, dealing with them with precise reactions. For instance, four months before the Little Girl appeared, C imagined that she had a piece of soap, a cloth, some water, a toothpick and some cotton, all of which she had seen her mother use for her little sister, three years younger than herself. She had nothing with which to represent these objects, and she acted as if each one were real; and I had to act in like manner, in order not to spoil the play.

A month before the Little Girl was first seen, when C was by herself, she imagined that she was in the presence of a little boy, with whom she frequently played. She spoke the boy's name, told him to do various things, and passed him imaginary objects, as if he were there to take them.

This, indeed, was the way C played with the Little Girl for

two and a half months, without there being any noticeable developments. At this later time, C was sitting on the floor talking. I heard this: "Everybody is bad; R is bad; A is bad." I turned and asked her to whom she was talking. She said, simply: "My Little Girl."

C was then three years and ten months old, and, as the conversation shows, had some positive knowledge of moral action. Some other developments that she had reached by this time, which have an ethical bearing, may be mentioned at this point.

I find that she had developed a fairly good sense of the passage of time, but lacked anything like accuracy. For a past day she would say, "Another day." For several nights back, she used this expression: "Last night and last night and last night." For more precise time, she used such expressions as "six old," or "months old," for the age of a child. For the time of day, she said it was "half-past minutes."

This fact, that the realization of time is preliminary to any high moral development, is significant, in view of the opinion of those ethical philosophers who consider that our moral nature is inseparably involved in the form of the human mind, which places everything in a temporal setting.

At this age, also, C often had a feeling akin to virtuousness, which was aroused by particular acts on her part, or on the part of others. This would be indicated by such a remark as, "Mama is good to give me that." This feeling is considerably more advanced than the indefinite feeling of attraction, or repulsion, which is consciously realized earlier than this period.

She was able to perform the superior mental act of giving a definition of terms. For instance, the word *serve* was used, and C seemed to understand its use. She was asked what it meant, and she replied: "Oh, to give people something to eat." (Age: 3 years 5 months.)

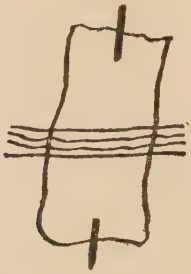
By this time, also, she realized that she was willful and did not exercise much self-restraint. When asked why she did acts that she knew she ought not to do, her answers were like this: "I want to," or, "I want to be naughty." (3 years 6 months.)

She had sufficient command of her imagination to allow her to express herself by drawing, with some success at form. At the age of 3 years 6½ months she outlined, from memory, on the sidewalk, her first successful hopscotch. (See next page.)

A week after the conversation with the Little Girl on human depravity, C was helping her mother take grapes off the stems, when she made this confidential remark: "My Little Girl wanted me to put the stems in with the grapes, but I

My model

C's copy



would n't." The suggestion, however, was too alluring to resist, for she soon put in many of the stems!

Here we have a moral drama. Impulse, in the form of a tempter, is victorious; but not without a struggle. The Little Girl is like the Homeric deity, who puts thoughts into the minds of the heroes. One passage is suggestive; it reads, in effect, "A god put it into his mind, or else he thought it of himself."

Nearly two weeks after this failure to resist the little tempter, C talked with her mother concerning the Little Girl. She said that her Little Girl ran away down the street, and that she would have to tie her. The Little Girl, here, is more objective than in the preceding instance, and does not have so much significance, but there seems to be an indication that C was rising a little above her desires. The conversation clearly shows that C had a good realization of a moral situation.

The Little Girl in this case was in danger of punishment, but she was not always the unfortunate one. When C was within two weeks of being four years old, she was taken down from the table, for misbehavior, and placed upon a couch in another room. Somewhat later, she began to kick, squirm, and scream, as if in great distress. Her mother went to her side and was told that the Little Girl was slapping her legs. C was immediately freed from this punishment, and she returned to the table in a sweet temper.

This castigation by the Little Girl came after the mother's punishment. C had lost her attitude of disobedience when the Little Girl began to cause the trouble. It was like a twinge, or, rather, a blow of conscience. Socrates's attendant deity was less vigorous.

The following morning the Little Girl appeared again. C was allowed to get into bed with her mother and father, but she moved about in an undesirable manner, in spite of expostulations from her elders. Finally, she displayed an entirely different attitude, and began to squeal and kick. Her Little Girl was hitting her legs! C became pleasant almost imme-

diately, and soon asked this question: "I wasn't naughty, when she was hitting my legs, was I?"

This is a drama that represents an internal struggle, with a well earned, though tardy victory.

These were typical performances of the Little Girl, when her activity was most marked. Some other of C's acts, at this period of moral struggle, serve to indicate more fully her mental condition. When she was three years and nine months old, two and a half months before the first chastisement by the Little Girl, C told her first complete falsehood, which was worked out in detail. Truth would have no meaning, were the false impossible. If a person did not have the ability to realize when a thought was inconsistent with one's larger consciousnesss, conscience would have no sphere of activity; indeed, no high type of mental life would be possible. Right and wrong, choice and decision, would be terms of little significance to a being that could not be false.

Some two weeks before this falsehood, her sensitiveness was prominent. If she cried, unnecessarily, she objected to having an uncle of hers look at her. She also showed much uneasiness at my approach, when she was doing something unusual, although the act itself might be of very slight consequence.

Also, a sense of personal individuality, a concept fundamental in ethics, seemed to be growing strong. C remarked to her mother (3 years 10 months): "Where did C D (her full name) come from?" She was told that she grew. C asked again: "Did I grow in this house?" She was told that she did. C continued: "Did I grow in the walls?" The answer is not recorded. She went on by asking whether the postman would bring another C D, if she were not there. She was told that the postman did not bring her little sister. But C was not to be turned aside by unessentials, and she persisted: "Would there be another C D?"

To return to the Little Girl, who could be mischievous: C was in the yard crying out as if in great fear and pain. Investigation was made, and it was discovered that the Little Girl was throwing stones at her. She was told to stop her actions, and peace was restored at once.

When C was within three days of being four years old, this episode occurred: We were about to begin supper, when C said that her Little Girl was going to put her down from the table. As usual, C asked to be released from this danger. We asked the cause, and C said that she herself was naughty; she wanted to take a piece of bread that her mama did not wish her to take. It seemed that she had been debating about reaching to the bread plate, and the thought came that she

ought not to. With that, the Little Girl had a chance, and started to put her from the table.

This was a still greater victory for C. She had made no overt act, and had not attempted one, and she was not advised by any person to restrain herself. But the conflict within herself was considerable.

Otherwise, she seemed to be getting a fuller realization of the meaning of permission; for she was overheard to call to a child across the street to come over, sometime, when her mother would let her.

The Little Girl seemed to be making a birthday visit; for, on the same day when, in imagination, C was nearly removed from the table, her mother reported this conversation as C was about to have her bath: "Mama, my Little Girl is playing in the water." (More excitedly.) "She is getting in with her clothes on." (Greater excitement.) "She is getting drowned."

C had often been restrained from beginning as the Little Girl did.

Again, on this same day, C remarked to her mother: "I have a little friend that was playing with matches. I told her not to, but she did, and she got all burned up, and I had to put her in the stove." Her mother: "That was too bad." C (with indifference): "Oh, another one came along and asked me if I didn't want her to be my friend."

This friend was not, identically, the Little Girl. The intimacy is lacking, but, otherwise, there is little difference. I am inclined to think, though, that this is the first instance of C's release from the thraldom of the Little Girl. From this time on, the Little Girl appeared with less frequency, and C played more with dolls for company. Still, the Little Girl made many visits.

Two weeks after the accident with matches, C woke crying, early in the morning. She said that her Little Girl was slapping her in the face. As I stood beside the bed, she cried out: "She is doing it now; tell her to stop." At the requested suggestion, the Little Girl, as usual, stopped slapping. C was quiet immediately, and was ready for sleep again.

About this time, C was apparently conscious of dreams of another sort. She had learned the word, and talked of dreams. Some of her accounts were very dreamlike, but it was difficult to say, in some cases, whether the dreams were experienced when she was awake or asleep.

During the next two months, the Little Girl changed greatly: from *one*, she was transformed into *many*. C was frequently in the company of a bevy of them, sometimes good, and sometimes bad. This certainly indicates the dissipation

of the power of the Little Girl. C, also, had more control over her fancy; for, this company of little playmates she managed much as she pleased, and frequently conjured up a group at will. After waking in the morning, and after going to bed, she often said there were a "lot of little girls" bothering her. These could aways be removed by some one's coaxing or driving them from the room. This was much like a game, and they usually bothered her no more than she chose to have them.

At this time of the dissipation of the Little Girl, C showed ability to govern her desires in other ways; and with this ability, arose a consciousness of merit, which was of considerable definiteness. Merit, it will be noticed, is another ethical concept of importance. This conversation occurred one Sunday: On the way to church, she saw some chalk marks, made by a child, on a telephone post. She said that she would not do that—she "knew better" than to do it. Further on, she told some persons that she would not talk in church—she knew better Twice more, before she returned home, she used the same expression.

The many girls would seem to indicate that C's social consciousness was growing. Of this there is other evidence. She began to ask her real playmates whether they liked her. She picked up the word *mad* (angry) and used it with understanding. She thought that objects ought to be personal, and was troubled over their inertness. She definitely asked, one day, "Why aren't everything people?" The next day she repeated the query in similar words: "Why isn't everything alive?"

The transformation of the Little Girl into an imaginary society of little girls, at a time when C's social consciousness was expanding, is otherwise interesting, psychologically, as bearing on the fact, that even our social world is our own mental construction, just as our moral struggles are all our own.

That C's personal moral struggles in self-control and obedience should be followed by a higher social development is, again, significant; because righteousness, for its activity, requires a social field.

It was at this time, also, when the little girls were many, that C learned the use of rules for games. She knew some of the rules for hopscotch, for example, and tried to apply them. The "one and the many" are necessary for the formation of general principles, which rules, of course, are.

The importance of general principles in the highest type of moral action is emphasized in Kant's theory of ethics. His categorical imperative is a rule for generalizing particular acts.

C made much progress in introspection. She used such expressions as these: "I have something on my mind." If she forgot what she planned to say, she remarked: "I had something on my mind, and I don't know what it was." She also came to realize a difference between the process of thinking, the act of thinking about some particular thing, and that of recalling an object from memory. She distinguished, too, between a temporary feeling—as when cross with her mother—and a more permanent disposition. This latter discrimination indicates a considerable ability to apply a standard in determining the value of feelings.

These last remarks have followed C up to the time she was four years and nine months old. The Little Girl, however, sometimes came back alone. When C was about four and a half years old, she stood watching the hanging of a hammock. It was partly in position, when she remarked in derision: "My Little Girl wants to get in it now."

By the time C was five years old, the visits of the Little Girl, or of the little girls, were very seldom. But while I have been writing this paper, one of those rare visitations has occurred. C is now nearly six years old. She stood in front of an oil stove, in active meditation, twisting an umbrella, the handle of which she was pointing toward the fire. While still in this position, she said to her mother: "My Little Girl told me to put the cloth of this umbrella in the flame of the fire, and throw it on the floor, and burn the house up, and I would n't do it."

Both C and the Little Girl, here, seem much as they did two years ago. And why should they not? There is an ethical standard that C has not reached, that of perfection, and she sometimes is guilty of lapses, even when she does "know better."

In this particular case, however, owing either to the greatness of the consequences, or to the presence of another person in the room with her, she resisted the temptation. So, it may be, a commentary from Milton would be as appropriate as the preceding one:

> "Evil into the mind of God or man
> May come and go, so unapproved, and leave
> No spot or blame behind."

MEDICAL INSPECTION IN TWO WORCESTER SCHOOLS

By George E. Emery, M. D.

In 1906 a bill was passed by the Massachusetts Legislature which became a law on the first day of September, 1906. It provides that every city and town shall appoint one or more school physicians who "shall make a proper examination and diagnosis of all children referred to him . . . and such further examination of teachers, janitors and school buildings as in his opinion the protection of the health of the pupils may require."

There must be referred to the school physician all pupils who have been absent on account of illness, unless they bring a certificate from the Board of Health, also those who have been absent from some unknown cause. All pupils showing signs of ill health as well as those suffering from infection or contagious disease must be referred to the physician.

Each pupil in the public schools must be "separately and carefully tested and examined at least once in every school year to ascertain whether he is suffering from defective sight or hearing or from any other disability or defect tending to prevent his receiving the full benefit of his school work, or requiring a modification of the school work in order to prevent injury to the child, or to secure the best educational results."

Notice of any such defect or disability requiring treatment must be sent to the parent or guardian of the child.

Fifteen inspectors were appointed in Worcester by the Board of Health and began work in October, 1906.

Our duties as outlined by Dr. Clark, then Chairman of the Board of Health, were to inspect such children as were referred to us by the teachers, and make weekly reports of such inspection.

At first the movement was not looked upon with great favor by all the teachers, but I was more fortunate than some others in receiving the hearty co-operation of the teachers with whom I came in contact.

At first all pupils who had been absent were referred to me, and for a few days I had a varied assortment of excuses offered, some about as follows: "Stayed at home to have his shoes repaired," "Stayed at home to mind the baby," "Went to a funeral."

And there were many others of equal interest from a medical standpoint. A prompt and vigorous protest from Mr. Coffey to the School Department soon brought that to an end. The other inspectors had about the same experience at first.

After inspection had been well started I found many pupils referred to me on account of sore throat. Some were found to be harboring lice in their hair, I asked to have all such pupils sent to the office for inspection. A few came from each room, but many teachers objected to making the preliminary inspection and very little was accomplished, except as I discovered the condition when the child was referred to me for other reasons. Frequently in passing through the school yard at recess time I have seen pupils with crusts of impetigo as large as a cent on their faces.

How teachers can come in contact with these pupils as well as those whose hair is covered with nits and not see their condition is beyond my comprehension.

With the approval of the Board of Health I asked permission to examine all the pupils in two schools with the idea of stamping out pediculosis if possible. My request was not granted, so I had to fall back upon the aid of the teachers and such opportunities as chance threw in my way when examining pupils for other reasons.

One inspector who went ahead in spite of opposition has succeeded in cleaning up his school; and those who opposed him now say they see a decided improvement in the general morale of the school. The pupils are cleaner and seem to take some pride in themseives.

Last spring Dr. Trowbridge, Chairman of the Board of Health, announced that we should be expected to make a general and thorough inspection of all pupils. The teachers were beginning to realize the good which was being accomplished and some of them were even anxious for the inspection to take place. This showed a decided increase of interest in the work. Among the pupils sent for examination after being absent, a number of cases of contagious diseases have been found:— scarlet fever, measles, whooping cough, diphtheria, chicken pox, and a few cases of trachoma.

I have no doubt serious epidemics have been averted by the systematic inspection of such pupils. One pupil at Harlow St. School was excluded because of sore throat. A week later I met him on the way to school and noticed that he was beginning to desquamate. I took him home and from his mother learned of two other cases which were reported to the Board of Health. Dr. Clark followed them up and found a third case. These were all mild and the patients going about their business while desquamating.

About the first of October of this year blanks were furnished by the Board of Health on which to record our findings and a systematic inspection of all the pupils was begun. The tests for sight and hearing are conducted by the teachers, but from all I can learn about these tests they are by no means complete and many of the record cards show normal vision when serious defects are really present.

As an illustration one principal told me of a boy who passed the test and was able to read all the letters readily, but always held his head to one side when reading because otherwise the letters ran together. On inquiry I find there is no test card for astigmatism. Judging by the small proportion of pupils found to have defective vision in my schools compared to the findings in other places I can but think many defects have escaped detection.

In examinations conducted in Cleveland in 1907 the percentage of those having defective vision in the well-to-do district was 32.4%, while in the poorer district it was 71.7%.

In fourteen other places it varied between 7.7% and 43% of the pupils examined. In Worcester it was 19.1%.

On preparing tables of the defects found in the various grades, I was surprised to find the wide variation from grade to grade. In the fifth grade only 34% had enlarged glands while in the sixth grade 80% showed this condition, and for the whole school 55%. This is not far from the proportion found in New York, 49 + % and Minneapolis 53%. Under this head I have included the submaxillary glands as well as the anterior and posterior cervical. Comparatively few pupils showed scars of suppurating glands. Among the younger children evidence of adenoids was more frequently found than among those of higher grades. The proportion among all the pupils examined was a little higher than reported in New York,—16% here, 12% in New York, and 12.8% in Minneapolis. Yet in the same table for New York under the head of defective nasal breathing the proportion is 14.4%.

The general nutrition of the pupils is better than I expected to find, 63 + % good, 32 + % medium and only 4% poor. In New York 6.3% are recorded as poorly nourished, and in Minneapolis 23.3%. This wide difference must be interpreted as a difference in standards and not in conditions.

My table shows a larger proportion of enlarged tonsils than either of the places I have mentioned, but when I felt in doubt about marking the card I asked the pupils about attacks of tonsilitis or sore throat and usually found they had had such attacks. To dispel any doubts I invited Dr. Holt to look at about fifty pupils and he confirmed my findings. The pupils were not selected to show the worst ones. The principal was

asked to send to the office ten or twelve pupils from each grade whose cards showed that they had enlarged tonsils.

The proportion of children with defective teeth was much larger than reported from some cities, but not as large as in some others. In Chicopee, Mass., among 500 pupils examined only one was found to have altogether sound teeth. I was not surprised that a large number should have poor teeth; but I was surprised that the average number per pupil should be so high; that is eight in the first grade and nearly four in the ninth grade.

In New York only 55% of the pupils showed defective teeth. This difference is probably to be accounted for by the easy access to the clinics at the various dental schools. In Boston from September, 1907, to February, 1908, 1,686 pupils with carious teeth were looked after by nurses. This probably means that they were taken to the clinics at the dental schools.

At least 30 cities of Germany support free dental clinics where work is done on the teeth of school children; 96% of children are reported to have defective teeth in some parts of Germany.

The mouths of some of the children examined by me were in a filthy condition, and have never known the application of a tooth brush. Among the first three hundred pupils examined, beginning with the first grade, only eight had received any attention from a dentist except extraction. In a rather large proportion of these children the sixth year molars had begun to decay and some of them were beyond repair.

In a paper which appeared recently the writer described the various forms of bacteria found in carious teeth. The list included the Klebs-Loefler and tubercle bacillus as well as many other forms. The theory has been advanced that tubercle bacilli enter the system and spread from a safe hiding place in carious teeth. This theory is not borne out by investigations of the negro race which is more susceptibe to tuberculosis, yet the colored people as a race have better teeth than the white race.

In his report on School Hygiene in Massachusetts, Geo. H. Martin, Secretary of the State Board of Education says:

It is evident that although this work involves medical inspection of school children at regular intervals, the oversight of the sanitation of the school buildings, and the prevention as far as may be, of the spread of infection and contagious diseases including skin diseases, activity in these three directions will be incomplete unless the personal and home life of the child are also brought under systematic supervision. The home is the point at which health must be controlled ultimately. The school nurse should be the link between the school and the

home, but in Worcester that link is missing. The nurse should follow up the pupils at their homes and see that they are treated by a physician or at the dispensaries, and should see that the treatment ordered is faithfully carried out.

The experience in other places has been that no attention has been paid to notices sent from the school in a large proportion of cases, and the same has been found here in regard to pediculosis, unless the child is excluded and the truant officer makes frequent calls. If a child is found to need glasses and the parents are too poor to pay for them, it should be possible to secure such glasses through the school department or some department at City Hall, but that is impossible at present. The only resource left is the Associated Charities and they have burdens enough already.

The District Nurses do help out but they have other work more urgent and so can give but little time to this work.

In some instances I think the family physicians have discredited the work of the school inspectors, perhaps feeling that we were interfering with their families; but that feeling I am sure is unjust. If the inspector is always careful to refer pupils to the family physician, when there is one, that feeling will soon disappear and we shall all work together for the good of the children.

TABLE I

Belmont St. School — *Physical Condition*

Grade	I		II		III		IV		V		VI		VII		VIII		IX		All Grades	
No. Pupils Tested	72		68		73		64		56		36		28		86		130		613	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Anæmia	1		1		1		1		2		1				10		3		20	3
Adenoids suspected	28	38+	14	20+	14	19+	7	11	6	10+	5	14			11	13	14	11—	99	16
Deformity Club foot	1																			
Cleft palate																	2			
Goitre					1															
Enlarged Glands				60	46	63	29	45	19	34	29	80+	15	53½	49	57	73	56	260	55
Ears defective					1		1				1		1		6	7	7	5+	17	3—
Eyes defective					13	18	9	14	8	14+	8	22	9	32	20	23	18	14	85	18+
Conjunctivitis															1		1			
Blind one	1		1								1						1		4	
Corneal ulcer	1												1							
Wear Glasses			1		3		3		1		3								11	
Heart Murmurs					5	6+			2	3½			2	7	4	4½	6	4½		
Lungs Bronchitis							1													
Nutrition Good				55	43	59	47	73+	36	64+	20	55½	18	53½	56	65	84	64½	301	63+
Nutrition Medium				35	28	38	11	17+	18	32+	16	44½	13	46+	27	31½	41	31½	154	32+
Nutrition Poor				10	2	3	6	9+	2	3½+					3	3½	5	4	18	4
Paralysis	2						1													
Rachitis	2																			
Pediculosis	21	29+	21	30+	26	35½	22	34+	16	28+	10	28	4	14	15	18	22	17	157	25
Teeth Sound	6	8⅓	4	6	4	5½	6	9+	10	18	8	22+	3	11	20	23+	38	29	99	16
Decayed	66	91⅔	64	94	69	94½	58	90+	46	82	28	78	25	89	66	77—	92	71	514	84
Tonsils	23	32	17	25	24	33	31	48½	15	37	18	50	13	46+	30	35	43	33+	214	35
Squint	2																			

TABLE II

Harlow St. School — *Physical Condition*

Grade	I		II		III		IV		V		VI		All Grades	
No. Pupils Tested	29		21		31		34		12		18		145	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Anæmia	1				1		4				3		9	6+
Adenoids suspected	9	31	11	52	4	13	7	20+	3	25	5		39	26+
Enlarged Glands	24	76	17	81	23	74	26	76+	6	50	12	66	108	74+
Ears defective			1										1	
Eyes defective	2	7—	2	9	4	13	7	20	1		1		17	11+
Wear glasses			1		3		2				1		7	4+
Squint	1		1										2	
Conjunctivitis			1										1	
Heart Murmurs							1						1	
Lungs Bronchitis	1				1								2	
Nutrition Good	15	52	8	38	15	48+	16	47	10	83	12	66+	76	52+
Nutrition Medium	11	38½	10	48	15	48+	15	44	2	17	5	27+	58	40
Nutrition Poor	3	10	3	14	1	3+	3	9			1	5+	11	7+
Pediculosis	4								2		1		7	4+
Teeth Sound	1	3+	1	4+	3	9+	4	12	1	8+	5	27+	15	10+
" Decayed	28	96+	20	96	28	90+	30	88	11	91+	13	71	130	89+
Tonsils	12	41+	8	38	10	32	14	41	6	50	7	39	57	39
Paralysis	1													

TABLE III

Condition of the Teeth

	Belmont St.									Harlow St.					
Grade	I	II	III	IV	V	VI	VII	VIII	IX	I	II	III	IV	V	VI
No. Pupils Tested	72	68	73	64	56	36	28	86	130	29	21	31	34	12	18
No. with sound teeth	6	4	4	6	10	6	3	20	38	1	1	3	4	1	5
No. with 1 decayed tooth	1	1	3	4	6		4	8	22		2	1	1	2	
2 " teeth	3	4	5	7	10	8	4	9	18	1	3		4		3
3 " "	3	3	4	6	6	9	5	20	15	5		4	9	1	2
4 " "	6	5	7	4	11	4	6	10	12	5	2	2	2	5	3
5 " "	6	4	16	8	6	4	2	6	6	2	5	5	4	1	3
6 " "	3	11	12	11	1	4	1	6	5	4	1	5	2	1	1
7 " "	6	10	5	7	4		1	3	7	2	2	2	3	1	
8 " "	10	7	7	4	1		1		2	4	1	3	3		1
9 " "	6	3	6	4		1		3	1	2	2				
10 " "	5	4	2	2	1				1		1	2	1		
11 " "	6	4	1						1	1		3			
12 " "	6	1	1					1	1	1					
13 " "	2	4					1						1		
14 " "	2	2		1											
15 " "	1	1							1			1			
18 " "										1	1				
Total No. with defective teeth	66	64	69	58	46	28	25	66	92	28	20	28	30	11	13
Average No. defective teeth per pupil	8	$7\frac{1}{3}$	$5\frac{2}{3}$	5	4−	3+	4	4	$3\frac{2}{3}$	6+	$5\frac{3}{4}$	$6\frac{1}{2}$	$4\frac{4}{5}$	4	4

REPORT ON THE POLISH CHILD STUDY ASSOCIATION

By Anna Grudzinska

Child study as a separate branch of psychology has, in recent years, awakened much interest in Poland. Among its pioneers were H. Wernic and A. Dygasinski whose first work consisted in rendering available through translation, the works of Preyer, Binet, G. Stanley Hall, Sully and others. The first original study made in Poland was Prof. J. W. David's "Observation of Children" in 1887, and a little later the studies of A. Szyc.

At this time there could be no question of founding a child study association, as the government forbade the formation of any new associations, even for scientific purposes. But as soon as, through the constitution in 1906, the formation of any society became possible, the Polish Child Study Association was immediately legalized, with a membership of over eighty from Warsaw and the adjacent country. During the first year, eight meetings were held and the administration decided upon the following lines of activity:

a. The opening of a reading room of periodicals for the use of those interested in psychology and child study. (This library was opened in Oct., 1907, and consists of one hundred and twenty journals and reviews.)

b. The opening of a library of scientific books.

c. The printing of questionnaires.

d. Organization of scientific meetings.

e. Public lecture courses.

f. The securing Mr. K. Stalykov's directions for anthropometrical measurements for the use of members.

g. The collection of funds for an experimental laboratory.

h. The printing of all the original studies made by members of the Polish Child Study Association.

i. The publication of a special review, devoted to the interests of the Polish Child Study Association.

During the year 1907-1908 seven meetings were held, at which the following papers were presented:

Sept. 27th. Aims and programmes of scientific meetings, by A. Szyc.
Children's drawings, by A. Grudzinska.

Oct. 25th. The significance of anthropometrical measurements in schools, by K. Stolykov.
Studies in Intelligence, by A. Szyc.

Nov. 28th. Psychology of arithmetic, by M. Borosiecka.
Children's language, by K. Appel.

Dec. 19th. The psychology of poor children, by J. Warszavska. (A discussion of Niceford's "La Race des pauvres.")
Development of moral ideas among children, by A. Szyc.

Jan. 23rd. The Language of Children, by K. Appel.
Notes on the language of a child, by J. Rzetkovska.
Remarks on the language of children, by William Grabovska.

Feb. 27th. The psychology of a nervous child, by Dr. W. Chodecki.
Psychology of Fear, by L. Wernic.

March 13th. Children's drawings, by A. Szyc.
Remarks on children's drawings, by W. Mazoviecka.

Of these fifteen papers, twelve were original investigations. A public lecture was also given by Dr. W. Chodecki on the suicide of children and adolescents.

During the year 1908-1909, ten meetings (three of which were devoted to discussion and arranging the programme for the year) of the Polish Child Study Association were held and three committees were appointed to collect and work up material on the following subjects: children's drawings, children's language and the mathematical concepts of children. The committee on children's drawings issued a questionnaire which was sent to infant, primary and normal schools. Through these, several thousand drawings were collected which formed a part of the Children's Art Exhibition in August. This material is now in the hands of the committee, and will be reported upon by them.

The committee on children's language issued two questionnaires, one adapted for children under three years and another for children from three to seven. It has also been decided to issue a third to cover the period of the first few school years.

The committee on the mathematical concepts of children, with the valuable aid of Prof. Dickstein, are working out a programme quite independent of existing systems. It is proposed to begin with the geometrical ideas of children, of direction, form, etc. Observations will begin at the 6th year. Reports of work done in other countries along this line will be given at future meetings of the Association.

The following papers were presented at the meetings held during the year 1908-1909.

April 24th. Backward children, by D. Zylterova.
May 22nd. Experimental psychology adapted to child study, by Dr. W. Sterling.
Psychological laboratories in Belgium, by Dr. Joteyko.
June 4th. Nobodies' children, by M. Kornfeld.
Imaginative types of lying, by J. Warzavska.
July 5th. Rich and poor children's ideas of wrong, by A. Szyc.
Dr. W. Heinrich's "Psychology of Feeling," by J. Kenig.
Oct. 24th. The significance of the psychological study of children, by J. W. David.
Drawings of country children, by J. Ciembrokievic.
Nov. 23rd. A new method of reading, by M. Falski.
A study of abnormal children by the Binet method, by D. Zylterova.
Dec. 21st. Discussion of previous papers.
The dramatic instinct of children, by W. Choranovska.

LITERATURE

How Two Hundred Children Live and Learn, by RUDOLPH R. REEDER. New York, Charities Publication Committee, 1910. 247 p.

The topics treated here are dietary, food interests and incentives, exercise, environment and play, industrial, economic, moral, religious instruction, punishment, motivation and personal touch, the diary of a day. The book is illustrated by a number of rather interesting cuts.

Games for the Playground, Home, School, and Gymnasium, by JESSIE H. BANCROFT. New York, The Macmillan Company, 1909. 456 p.

These games are described under the following captions:—counting out, choosing sides, who is it, miscellaneous, active games, quiet games, feats, singing games, balls and bean-bags; and then follow the indexes, viz., games for elementary schools, high schools, for playgrounds, gymnasiums, and large numbers, games for boys and girls, summer games, house parties, country clubs, children's parties, seashore games, etc. There are a number of interesting illustrations and often the music is added, together with the words and diagrams for games. The book is provided with a good index for each kind of game, of which in all there are several hundred. Admirable as this work is, it would add materially to its value if the author had appended at least a few references on the literature of the subject.

L'Amérique Précolombienne. Essai sur L'Origine de sa Civilisation. Quebec, Laflamme et Proulx, 1908. 376 p.

It is a great convenience for all interested in this subject to have the main conclusions of the multifarious and scattered studies in this field brought together in so compact and convenient an epitome with plenty of illustrations. The writer of this notice is entirely unable to judge of the quality of the scholarship illustrated by its pages but no one can fail to be impressed by the magnificence of the monuments which are represented in these cuts.

La Vie Mentale de l'Adolescent et ses Anomalies, par AUG. LEMAITRE. Saint Blaise, Foyer Solidariste, 1910. 240 p.

The first chapter deals with the thoughts of adolescents; then takes up the chief synopsis, such as personification, color audition, diagrams. Then follow the rare synopses illustrated by several cases. Chapter four, internal language; chapter five, paramnesias, those with fixed dates, kinetic, negative, and with reversed images. Under mental dissociations he treats ecstasies, autoscopies, autoscopic dreams and hallucinatory guidances. He describes several cases of complex hallucinations. Then follow chapters on multiple personalities, parapsychisms, bad habits, and suicides.

Stories and Story-telling in Moral and Religious Training, by EDWARD PORTER ST. JOHN. Boston, The Pilgrim Press, 1910. 100 p.

This is a timely, effective and condensed message to all interested. It tells us what the story really is, how to get the best out of their idealism and realism, some vital traits of good stories, some tricks of the trade, learning how to tell them, the story interest in childhood, in early and in later adolesence, the source of the story's power and

where to find them. The author has thought and read carefully upon the subject and introduces at the end of each chapter effective quotations from others, outlines of study, and suggestions for further work, together with literature.

Echoes from the Forest, by H. W. BUGBEE. Boston, Richard G. Badger, 1905. 71 p.

These poems, by a young amateur, certainly have a genuine ring and flavor to them. It is doubtful whether any one has more profoundly appreciated the scenes that are characteristic of Western Massachusetts than this writer. The gloomy days, bluebirds, a forest stream, hemlocks, Indian summer, spring, the Connecticut River, the pine, equinoctial, moon, violets, dream life, the forest spirit, the fire-light, immortal days,—all these are treated with a genuine and sometimes rather touching and moving poetic spirit.

The Awakening of Spring. A Tragedy of Childhood, by FRANK WEDEKIND. Translated from the German by Francis J. Ziegler. Philadelphia, Brown Brothers, 1909. 161 p.

This drama produced intense excitement in Germany but its production, we believe, has not yet been allowed by law in this country. It is in plain words the story of a boy who violated the chastity of a young girl because the latter was absolutely ignorant and innocent, who nevertheless had to pay the penalty of her mistake by her life. It is pathetic but so intensely realistic are its conversations and its story that it offends the delicacy of many people.

A Book of Verse, by HAROLD BARNES. C. F. Gardner Printing Co., Princeton, Ind.

Here we have a group of poems by a young man which are full of the spirit of the West. There is an ode to the chigger, a charaterization in a few lines of a religion without a creed, Old Glory, when the flies come back, death, friendship, Fremont and the Union, the discovery of America, a season's song, class song, southern Indiana, Kansas, sleighbells, Marie, an April shower, etc.

The Evolution of the Child Mind, by MARY HIGGS. London, The Froebel Society of Great Britain and Ireland, 1910. 67 p.

This résumé is devoted chiefly to moral education, which is treated under the captions of the unmoral, the imitative, the personal and altruistic stages. Then follows a chapter on the home and the school. The author writes with a fine feeling for, and large knowledge of, her subject, which she approaches perhaps rather more from the broad humanistic view than from that of a specialist.

Annual Report of the Board of Regents of The Smithsonian Institution. Showing the Operations, Expenditures and Condition of the Institution for the Year Ending June 30, 1908. Washington, Government Printing Office, 1909. 801 p.

Besides the report of the secretary, which this year covers over eighty pages, this volume contains an unusually interesting collection of essays from various sources, mostly on physical science, with a number of biological essays included. As usual, the number of illustrations is copious and their quality as a rule excellent. By reading these papers a general reader can keep well abreast of the development of the sciences it treats.

Men and Women of America. A Biographical Dictionary of Contemporaries. New York City, L. R. Hamersly & Co., 1910. 1592 p.

It is really a second edition of another work entitled "Men of

America," although nearly half the biographies in the present volume are entirely new. We also have quite a number of full page portraits introduced. We are not informed whether these plates are paid for by those who appear or, if so, at what cost to the authors, if any. Their selection can hardly be said to be determined by as careful methods as those applied to the selection of the members of the Temple of Fame. A good many of these had certainly never been heard of by the writer of this notice until they appeared here.

Epitaphia: being a collection of 1,300 British epitaphs grave and gay, historical and curious, annotated with biographical notes, anecdotes, etc., by ERNEST R. SUFFLING. London, L. Upcott Gill, 1909. 476 p.

This work opens with an introduction upon modes of burial and the general survey of interment in the British Isles from early times, together with an account of peculiar interments, church folk-lore, and a short chapter upon American epitaphs. The author has spent forty years as a stained glass artist and in the course of his business has visited nearly every part of the British Isles, including many odd nooks seldom visited. It has also made him acquainted with many clergymen who are lovers of archæology, folk-lore and other fields of antiquity. He habitually noted all these things by the way and so has accumulated an immense budget of matter himself, which has been supplemented by reading. He has divided his material into several score of necessarily rather arbitrary captions, such as laudatory, bombastic, epigrammatical, witty, profane, chronograms, wives, husbands, children, large families, eating, drinking, epitaphs on animals, soldiers, sailors, lovers, anglers, hangings, death by murder, lightning, and various accidents, illiterate epitaphs, heart and skull burial, Irish, Scotch and English, and many other types of epitaphs.

Exposition and Illustration in Teaching, by JOHN ADAMS. New York, The Macmillan Company, 1910. 428 p.

This book is dedicated to the author's old teacher, James Liddell. Its chief topics are as follows: nature and scope of exposition and illustration, mental content, activity, backgrounds, suggestion, conditions of presentation, its order, exemplification and analogy, the story as illustration, elaboration, degree in illustration, the picture, diagram, and dangers of illustration.

A Manual of Common School Law, by C. W. BARDEEN. 9th edition. Syracuse, N. Y., C. W. Bardeen, 1910. 470 p.

This is an admirable compilation which cannot fail to be serviceable, especially to teachers of New York. The law is epitomized and very conveniently arranged under districts, duties of officers, taxes, hiring, classification and wages of teachers, dismissal of teachers, duration of contract, attendance, hours, rules, authority, compulsion, course of study, punishment, suspension, certificates, the union, town, city, county, state, school, and the regents of the university.

Bibliotheca Pædagogica. Verzeichnis der neuesten Lehrmittel sowie von Werken der Erziehungs-und Unterrichts-Wissenschaft. 19. Jahrgang, 1908.

This remarkable index of illustrative pedagogical material, which is copiously illustrated, containing even many colored charts, bears as its motto the sentence of Pestalozzi that *Anschaung* is the absolute basis of all knowledge. The literature is conveniently arranged under some twenty-two captions, following partly grades and partly topics, such as reading and writing, elementary arithmetic and

geometry, history of literature, language, physics, political geography, trade, commerce, history of culture, art, anthropology, hygiene, microscopy, zoölogy, botany, chemistry, technology, drawing, industries, gymnastics, singing and music, etc.

Report of the Commissioner of Education for the year ending June 30, 1909. Volume I. Washington, Government Printing Office, 1909. 598 p.

We most heartily congratulate the new Commissioner of Education, Dr. Brown, on his progress in catching up. The first long chapter is devoted to current topics very comprehensively. Then follow an account of educational legislation, state associations, Hawaii, the Philippines, Porto Rico, progress in Argentina, Great Britain, Ireland, France, schools for crippled children abroad, and current foreign topics.

War on the White Slave Trade. A Book Designed to Awaken the Sleeping and to Protect the Innocent. Edited by Ernest A. Bell. Chicago, Charles C. Thompson Co., 1909. 481 p.

Thirteen writers, all of them apparently earnest social workers in this field, have written this book, which contains thirty-three chapters, together with various illustrations. It gives the history of the white slave traffic and the efforts at suppression, describes its dangers, a clearing house, various confessions from those who have been rescued, has a most condemnatory chapter on the state of things in Boston, which it says is hypocritical in that to such an extent it ignores the existence of the evil, gives the history of the Midnight Mission, and describes present conditions in quite a number of cities, has a special study on the recruiting ground, practical means for the protection of girls, on the diseases, the black plague, how the procuresses, pimps and panders work, etc. One of the best chapters is an epitome of the laws of different states, which, while it shows a great variety, indicates gradual approximation. There can be no doubt whatever that many girls are allured, drugged, made love to, even subjected to false marriages, attracted by promises of good employment and large wages, and sometimes actually seized bodily and sold into a life of shame, where they sometimes spend years against their will and in a few cases behind actual iron bars, which were photographed. Country girls are especially played upon in this way, so that special agents of protective societies are now stationed at many ports and central railroad stations to be ready to protect the innocent upon their arrival. Boston is credited with having a rather unique system which is described as that of cadets, and a call system where women are summoned by telephone. This city claims advantage in having no special groups of infamous houses, that is, no red-light district, but in having these houses scattered through different parts of the city. Unfortunately in this latter city a schism has arisen between the Watch and Ward Society, which aims to protect the innocent, and the police commissioner. The Society claimed to have a list of two hundred houses but admits that its list was made up more than two years ago, while the commissioner claims to have suppressed more than three-fourths of all these houses. One very practical point in all this work is how evidence shall be obtained. While the police can send detectives disguised to get evidence, the commissioner intimates that societies often find it difficult to do so without sending agents who themselves participate in the vicious practice of the house.

Source Book for Social Origins, by WILLIAM I. THOMAS. University of Chicago Press, Chicago, 1909. 932 p.

This book had its origin in the necessities of the class-room, but it

is hoped may be the means to extending interest in the beginnings of social society to a larger public. The five parts of the book must suffice to briefly designate its scope. They are as follows: 1. The Relation of Society to Geographic and Economic Development (here seven papers by as many different authors are printed); 2. Mental Life and Education; 3. Invention and Technology; 4. Sex and Marriage; 5. Art, Ornament, and Decoration; 6. Magic, Religion, and Myth; 7. Social Organization, Morals, and the State.

The Face of China, by E. G. KEMP. Chatto & Windus, London, 1909. 276 p.

Nearly all the material of this book is drawn from personal observation and from information obtained on the spot by missionaries. It discusses the sphere of German influence, silk, the sacred shrine, the home of Confucius, the yellow river, Peking, the Pehan Railway, on the Yang-tse, Mt. Ome, from China to Burmah, the present situation in China. The work is enlivened by several scores of drawings, photographs, and colored pictures of various kinds, which make up a very large part of the merit of the volume.

Work of the Colored Law and Order League, by JAMES H. N. WARING. Committee of Twelve, Cheyney, Pa., n. d. 29 p.

This is a report of a body composed of the best colored men of Baltimore, together with those foremost in civic betterment, and contains results of investigations of colored neighborhoods: sanitary conditions, density of population, the number of saloons, their relation to schoolhouses, to saloons for the whites, etc., with various maps, average earnings, occupations, fecundity, etc.

Der einzige Kind und seine Erziehung, von EUGEN NETER. 3. und 4. Auflage. Otto Gmelin, München, n. d. 50 p.

The subtitle of this work is "An earnest word of admonition to teachers and educators." The pitifulness of the only child is depicted in rather strong colors. Their moral and physical character is defective. The topic is a grave one; but despite Baginsky's word of introductory commendation, the author writes in apparent ignorance of the literature on the subject and leads us to infer that he is first in the world to call attention to the subject. It is singular that there is not a library reference in the whole book.

The Crime Problem, by VINCENT MYRON MASTEN. Star-Gazette Co., Elmira, N. Y., 1909. 156 p.

This is a straightforward, simple presentation of a great subject containing slight but effective chapters upon immigration, our present system, that of Britain; primary and secondary industrial schools; reformatories; convicted prisoners, houses of reception, stages, the employment of officers, identification, pension features, general and specific discipline; conclusions.

Principles and Methods of Moral Training, with Special Reference to School Discipline, by J. WELTON and F. G. BLANDFORD. London, W. B. Clive, 1909. 262 p.

The chapters here are, nature of moral training, habit, duty, virtues, conscience, school, community, exercise of discipline, organizations of the school, relations between it and the home, stimulus, and restraint.

Illustrierte Völkerkunde, herausgegeben von GEORG BUSCHAN. Strecker & Schröder, Stuttgart, n.d. 464 p.

This is a copiously illustrated and excellent text-book in anthro-

pology where data are arranged according to countries. First comes North, South and Central America, Oceanica, Asia, Europe and Africa.

A Course of Study and Teachers' Handbook in the Common Literature of Life, by ALLISON WARE. San Francisco State Normal School Bulletin No. 10 (new series). Sacramento, W. W. Shannon, 1909. 207 p.

This is a very thorough-going and comprehensive study which impresses us as perhaps on the whole the very best of many good ones that have proceeded from the San Franciso Normal School. We confess, however, we would like to see the whole thing in operation.

Register of International Correspondence Schools. Third edition. Scranton, Penna., International Correspondence Schools, n. d. 251 p.

This large volume contains the names of 107,239 students who have completed their courses or have made considerable progress therein, together with an explanation of the I. C. S. system of instruction by mail. It is the third edition. Most of their students complete arithmetic and perhaps one or more other topics.

Die Jubelfeier des 500 jährigen Bestehens der Universität Leipzig—85 Bilder nach offiziellen photographischen Aufnahmen. Text von Privatdozent M. Brahn, Leipzig. Röder & Schunke, Leipzig, 1909. 64 p.

This work consists of sixty-four full-plate photographs, together with a preface and explanation describing the recent five-hundredth anniversary celebration at Leipzig.

Die Flugmaschine, herausgegeben von E. RUMPLER. Gustav Braunbeck, Berlin, 1909. 327 p.

This work is to some extent historical but comes down to the present, has many score of illustrations, and gives the Wright Brothers the place of honor.

Christus Centuriarum, by JAMES DAVIDSON DINGWELL. Boston, Richard G. Badger, 1909. 59 p.

This is a collection of poems by a clergyman. They seem to contain a ring of genuineness and sincerity. They are dedicated to his parents.

Human Physiology. An elementary Text-book of Anatomy, Physiology, and Hygiene, by JOHN W. RITCHIE. New-World Science Series. Yonkers-on-Hudson, New York, World Book Company, 1909. 362 p.

Smithsonian Institution and United States National Museum. Report of the Progress and Condition of the United States National Museum for the Year Ending June 30, 1909. Washington, Government Printing Office, 1909. 141 p.

The Mendel Journal, October, 1909. London, Taylor, Garnett, Evans & Company. No. 1, 216 p.

Studies of Our Cone-Bearing Trees, by EDITH R. MOSHER. Syracuse, N. Y., C. W. Bardeen, 1909. 23 p.

La Langue Internationale et la Science. Considérations sur l'introduction de la langue internationale dans la science, par L. COUTURAT, O. JESPERSEN, R. LORENZ, W. OSTWALD L. PFAUNDLER. Traduit par M. Boubier. Paris, Ch. Delagrave, 1909. 67 p.

The Aims, Scope and Methods of a University Course in Public School Administration, by FRANK E. SPAULDING, WILLIAM PAXTON BURRIS, and EDWARD C. ELLIOTT. National Society of College Teachers of Education. May be obtained by addressing Frederick E. Bolton, Iowa City, Iowa, n. d. 94 p.

Some Desiderata in the Science of Eugenics and Bibliography of Historiometry, by FREDERICK ADAMS WOODS. Breeders' Association, November, 1909. 6 p.

Beginner's Botany, by L. H. BAILEY. The Macmillan Company, New York, 1908. 208 p.

This is an admirable text with 302 illustrations, written by a master, and based on the assumption that in teaching plants and animals to beginners, they themselves should be made the theme, and the pupil at the start should have first-hand acquaintance with the entire plant.

Plant Study and Plant Description, by W. H. D. MEIER. Ginn & Co., Boston, n. d.

This is an elaborate set of pages on plant study, with directions for laboratory and field work. All is bound up with blank sheets, with which the student can illustrate the methods set forth in the text.

The Agricola of Tacitus. With introduction and notes by Duane Reed Stuart. The Macmillan Company, New York, 1909. 111 p.

The Russian Fairy-book, translated by Nathan Haskell Dole. Grant Richards, London, 1908. 126 p.

This work contains seven stories ; Vasilisa, the Beauty; The Bright Hawk's Feather; Ivan and the Gray Wolf; The Little Sister and Little Brother; The White Duckling; Marya; Morevna and the Frog Queen; with sixteen full-page, colored illustrations.

The Origins of Leadership, by EBEN MUMFORD. The University of Chicago Press, Chicago, 1909. 87 p.

Report of the Commissioner of Education for the Year ending June 30, 1906. Vol. II. Government Printing Office, Washington, 1908. 645-1308 p.

NOTES

The decree of the Austrian Minister of Education Oct. 22, 1909, required the provisional introduction of medical inspection into a number of state institutions on the first of December last. This inspection is to be made by the instructor in hygiene, if he is willing to take up the service; and he receives additional pay for the work. The law further provides for sanitary inspection of the school buildings and medical inspection of the pupils in the practice schools.

The inspection of school buildings is to be made once each year by the school physicians in co-operation with the director of the institution, and the engineer who has charge of the building. The inspection is to include the whole institution, and all matters relating to heating, ventilation, natural and artificial lighting, the condition of the doors, windows, curtains, floors and seats. Special attention is to be given to the gymnasium. Further the inspection is to extend to the character of the drinking water, the arrangements for personal cleanliness, the work rooms, rooms for clothing, the playgrounds, courts, etc.

In the practice schools, inspection of the pupils not only for contagious diseases, but as regards general physical condition, and special investigations in cases where suspicion of contagious disease makes this necessary is provided for. In the kindergarten special attention is given to the detection of contagious diseases.

As regards the students who are in training for the position of

teacher, provision is made for tests of the health condition of all entering pupils; and the physical examination follows substantially the same lines as that required in the practice schools. The half yearly measurement of the chest can be limited to those candidates who are of weak constitution or where lung disease is suspected. The school physician is required also to lecture on the aim of medical inspection.

Blanks and instructions are provided. The health blank for each pupil to be filled out by the physician contains 22 rubrics, besides advice in regard to the school, observations by the teachers, and communications to the parents. They are as follows: (1) height, (2) weight, (3) chest girth, (4) general condition of nutrition and strength, (5) general diseases, (6) glandular swellings, (7) thyroid gland, (8) mouth and teeth, (9) nose and throat, (10) larynx and speech, (11) condition of the lungs, (12) abdominal hernias, (13) organs of circulation, (14) urinary organs, (15) bones, joints, muscles, (16) nervous diseases, (17) mental development, (18) eyes and visual acuity, (19) ear and hearing, (20) skin diseases and parasites, (21) diseases passed through, (22) special remarks. W. H. B.

The first Congress of Polish Neurologists, Psychiatrists and Psychologists was held this year at Warsaw, October 11 to 13. Nearly three hundred savants from all parts of Poland were present. In the psychological section the following subjects were presented. Psychological Method by Prof. Dr. Kasimir Tvarsovski; Unconscious States, by E. Abramovski; Researches on Intelligence, by Prof. J. W. David; Subjective Selection, by Dr. A. Radzivillovicz; a New Theory of Memory, based upon experiment, by A. Abramovski; The Psychology of Artists, and Unconscious States, by A. Lubecki; Concerning Perception, by Dr. W. Bieganski; Mental Development, expressed quantitatively; the Adaptation of Psychology to the Present State of Science, and the Needs of Individual Education, by Prof. J. W. David; Researches on the Intelligence of Normal and Abnormal Children, by Dr. D. Lylbezowa; The Significance of Lombroso in the Field of Criminal Psychology, by S. Posner; Is Psychology a natural Science or Philosophy?; The Psychological Theory of Space, and the Scale and Evolution of the Senses, by M. Hraszevski; the Development of Ideas and Interests in Children during School Hours, by A. Szycovka; Experimental Contributions to Researches on Perception of Depth, and on Applied Psychology, by L. Kaopinska; The Relation of Mind and Body from the Standpoint of the Theory of Knowledge, by J. Levkovicz; Observations on Reproductive Ideas, and Psychology in Schools, by J. Segas; On the Kiff and X Rays, by J. Ochorovicz; The Mind of the Child in the Light of Experimental Psychology, by W. Herling; The Theory of Feelings, by A. Mahrbourg; Experimental Researches on the Psychophysiology of Pain, by Dr. M. Hefanovka; Changes of Personality by A. Thatnicki; The Threshold of Nervous Excitability in the Light of the Principle of Selection, by J. Wasserberg. All these papers were followed by discussion, and great interest was shown throughout the Congress. Among the more notable papers those of Prof. Dr. Hraszevski—who is not an advocate of the laboratory method in psychology but a representative of the Vienna Brentano school—on Methods in Psychology; of Professor David, who presented a new theory of intelligence which attracted much attention; and of Mr. Ochorovicz whose investigation of the new ray X aroused much discussion. The latter brought with him to the Congress, a young girl of mediumistic powers to illustrate his theory. These investigations have been published in the Annales des Sciences Psychique. ANNA GRUDZINSKA.